Estimating and Costing

Question No. 01

The rate of payment is made for 100 cu m (per % cu m) in case of

(A) Earth work in excavation
(B) Rock cutting
(C) Excavation in trenches for foundation
(D) All the above
Answer: Option D

Question No. 02

The rate of an item of work depends on

(A) Specifications of works
(B) Specifications of materials
(C) Proportion of mortar
(D) All the above
Answer: Option D

Question No. 03

The main factor to be considered while preparing a detailed estimate, is

(A) Quantity of the materials
(B) Availability of materials
(C) Transportation of materials
(D) All the above
Answer: Option D

Question No. 04

Pick up the correct statement from the following:

(A) The estimated value of the work excluding the amount for contingencies, work charged establishment, tool and plants, is called work value
(B) The actual expenditure involved to complete a work including incidental, establishment and travelling charges, is called actual cost
(C) The formal acceptance by the administrative department for incurring an expenditure on the work, is called administrative approval
(D) All the above
Answer: Option D

Question No. 05

Brick walls are measured in sq. m if the thickness of the wall is

(A) 10 cm
(B) 15 cm
(C) 20 cm
(D) None of these

Answer: Option A

Question No. 06

The plinth area of a building not includes

(A) Area of the walls at the floor level
(B) Internal shaft for sanitary installations up to 2 sq m. in area
(C) Lift and wall including landing
(D) Area of cantilevered porch

Answer: Option D

Question No. 07

If the formation level of a highway has a uniform gradient for a particular length, and the ground is also having a longitudinal slope, the earthwork may be calculated by

(A) Mid-section formula
(B) Trapezoidal formula
(C) Prismoidal formula
(D) All the above

Answer: Option D

Question No. 08

While estimating a reinforced cement structure, the omitted cover of concrete is assumed

(A) At the end of reinforcing bar, not less than 25 mm or twice the diameter of the bar
(B) In thin slabs, 12 mm minimum or diameter of the bar whichever is more
(C) For reinforcing longitudinal bar in a beam 25 mm minimum or diameter of the largest bar which is more
(D) All the above

Answer: Option D

Question No. 09

A cement concrete road is 1000 m long, 8 m wide and 15 cm thick over the sub-base of 10 cm thick gravel. The box cutting in road crust is

(A) 500 m^3
(B) 1000 m^3
(C) 1500 m^3
(D) 2000 m^3

Answer: Option C

Question No. 10

While estimating the qualities for the construction of a building, the correct metric unit is

(A) Metre for length
(B) Cubic metre for area
(C) Square metres for volume
(D) Litre for capacity

Answer: Option D

Question No. 11

Pick up the correct statement from the following:

(A) In order to check up the average depth of excavation, 'Dead man's' are left at the mid-widths of borrow pits

(B) The earthwork calculation in excavation is made from the difference in levels obtained with a level

(C) The earth work in excavation to form the road embankment includes the formation of correct profile and depositing the soil in layers

(D) All the above

Answer: Option D

Question No. 12

The brick work is not measured in cu m in case of

(A) One or more than one brick wall

(B) Brick work in arches

(C) Reinforced brick work

(D) Half brick wall

Answer: Option D

Question No. 13

Pick up the incorrect statement from the following:

(A) Lead is the average horizontal straight distance between the borrow pit and the place of spreading soil

(B) The lead is calculated for each block of the excavated area

(C) The unit of lead is 50 m for a distance upto 500 m

(D) The unit of lead is 1 km where the lead exceeds 2 km

Answer: Option D

Question No. 14

The assumption on which the trapezoidal formula for volumes is based, is

(A) The end sections are parallel planes

(B) The mid-area of a pyramid is half the average area of the ends

(C) The volume of the Prismoidal is over-estimated and hence a Prismoidal correction is applied

(D) All the above

Answer: Option D

Question No. 15

In the mid-section formula

(A) The mean depth is the average of depths of two consecutive sections

(B) The area of mid-sections is calculated by using mean depth

(C) The volume of the earth work is calculated by multiplying the mid-section area by the distance between the two original sections

(D) All of the above

Answer: Option D

Question No. 16

Pick up the correct statement from the following:

(A) The earth work of cutting in trenches or borrow pits in fairly uniform ground is measured with the help of average depths of the dead men

(B) The earth work in trenches or borrow pits in irregular ground is measured by taking the difference in levels before and after completion of work

(C) The earth work in trenches or borrow pits, where neither a nor b is feasible, are measured from the fillings after deduction of voids

(D) All the above

Answer: Option D

Question No. 17

The cross-sections for a highway is taken at

(A) Right angle to the centre line

(B) 30 metres apart

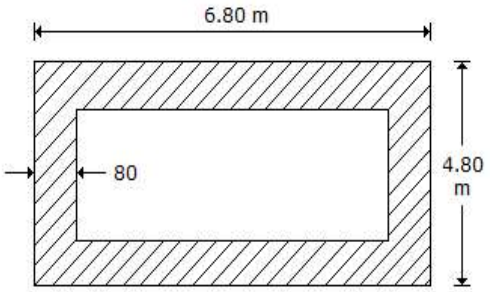
(C) Intermediate points having abrupt change in gradient

(D) All the above

Answer: Option D

Question No. 18

Referring of given figure, pick up the correct statement from the following:



(A) The total length of centre line of four walls is 20 m

(B) Length of long wall out-to-out is 6.80 m

(C) Length of short walls in-to-in is 3.20 m

(D) All the above

Answer: Option D

Question No. 19

Pick up the correct statement regarding the centre line method of estimating a building

(A) Product of the centre line of the walls and area of cross-section of any item, gives total quantity of the item

(B) The centre line is worked out separately for different sections of walls of a building

(C) The centre line length is reduced by half the layer of main wall joining the partition wall

(D) All the above

Answer: Option D

Question No. 20

According to Indian Standards Institute, the actual size of modular bricks is

(A) 23 cm × 11.5 cm × 7.5 cm

(B) 25 cm × 13 cm × 7.5 cm

(C) 19 cm × 9 cm × 9 cm

(D) 20 cm × 10 cm × 10 cm

Answer: Option C

Question No. 21

The following item of earth work is not measured separately.

(A) Setting out of works

(B) Site clearance

(C) Steps in deep excavation

(D) All the above

Answer: Option D

Question No. 22

The measurement is made in square metre in case of

(A) Cement concrete in foundation

(B) R.C.C. structure

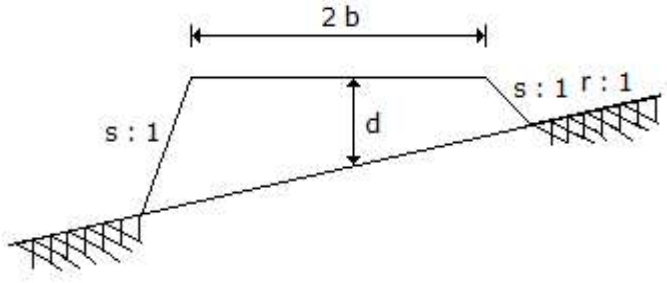
(C) Hollow concrete block wall

(D) None of these

Answer: Option D

Question No. 23

The area of the cross-section of a road fully in banking shown in the given figure, is



(A) $[sb^2 + r^2 (2bd + sd)^2]/(r^2 - s^2)$

(B) $[sb^2 + r^2 (2bd + sd)^2]/(r^2 - s^5)$

(C) $[sb^2 + r^2 (2bd + sd)^2]/(r - s)$

(D) None of these

Answer: Option A

Question No. 24

Cost of fittings and their fixing is specified for the following sanitary fittings

(A) Water closets

(B) Flushing pipes

(C) Lavatory basins

(D) All the above

Answer: Option D

Question No. 25

The excavation exceeding 1.5 m in width and 10 sq.m in plan area with a depth not exceeding 30 cm, is termed as

(A) Excavation
(B) Surface dressing
(C) Cutting
(D) Surface excavation

Answer: Option D

Question No. 26

For the construction of buildings, the subheads of the estimate are

(A) Earthwork, Concrete work, Brick work
(B) Brickwork, Stone work, Roofing
(C) Brickwork Flooring, Wood work, Steel work
(D) All the above

Answer: Option D

Question No. 27

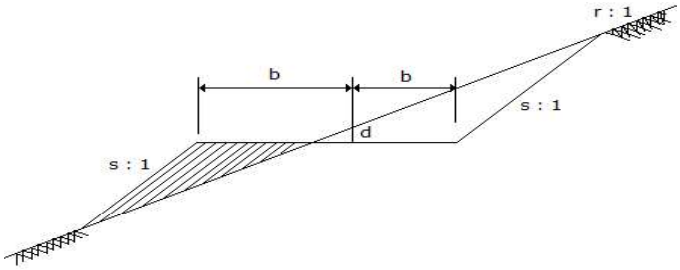
Pick up the correct statement from the following:

(A) Pointing is measured in sq.m
(B) Plastering is measured in sq.m
(C) Glazing is measured in sq.m
(D) All the above

Answer: Option D

Question No. 28

The cross-section of a road partly in banking and partly in cutting is shown in the given figure. The area of the shaded portion is



(A) $\frac{1}{3} \times (b - rd)^2/(r - s)$
(B) $\frac{1}{3} \times (b - rd)^2/(r + s)$
(C) $\frac{1}{2} \times (b + rd)^2/(r - s)$
(D) $\frac{1}{3} \times (b - rd)^2/(s - r)$

Answer: Option A

Question No. 29

Pick up the correct statement from the following:

(A) If the bed level is above N.S.L. the canal is called fully in baking and the berms are designed as 3 *d* where *d* is full supply depth of water (F.S.D.)

(B) Area of canal in cutting = $BD + Sd^2$ where *B* = bed width, *d* = depth of cutting and *S* is the side slope

(C) If F.S.L. is above N.S.L the canal is called partly in cutting and partly in filling and berms are designed as 2*d* where *d* is full supply depth

(D) All the above

Answer: Option D

Question No. 30

Pick up the incorrect statement from the following:

(A) No deduction is made for the volume occupied by reinforcement

(B) No deduction is made for the openings upto 0.1 sq.m

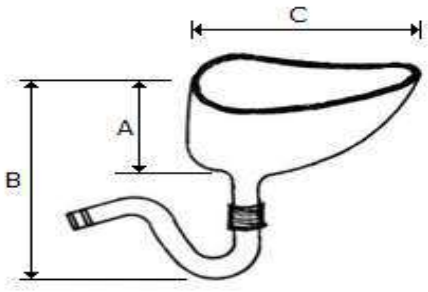
(C) No deduction is made for volumes occupied by pipes, not exceeding 100 sq.cm in cross-section

(D) None of these

Answer: Option D

Question No. 31

The value of '*B*' of Indian type W.C. shown in the given figure is:



(A) 45 cm

(B) 50 cm

(C) 30 cm

(D) 25 cm

Answer: Option A

Question No. 32

Pick up the excavation where measurements are made in square metres for payment.

(A) Ordinary cuttings up to 1 m

(B) Surface dressing up to 15 cm depths

(C) Surface excavation up to 30 cm depths

(D) Both (b) and (c)

Answer: Option D

Question No. 33

As per Indian Standard Specifications, the peak discharge for domestic purposes per capita per minute, is taken

(A) 1.80 litres for 5 to 10 users
(B) 1.20 litres for 15 users
(C) 1.35 for 20 users
(D) All the above
Answer: Option D

Question No. 34

In long and short wall method of estimation, the length of long wall is the centre to centre distance between the walls and

(A) Breadth of the wall
(B) Half breadth of wall on each side
(C) One fourth breadth of wall on each side
(D) None of these
Answer: Option B

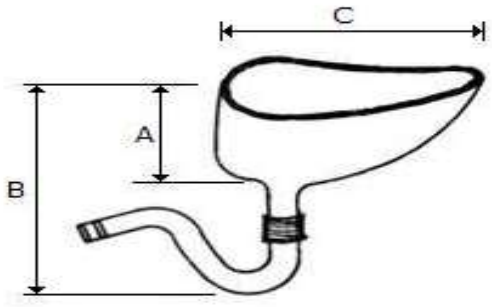
Question No. 35

The expected out turn of cement concrete 1 : 2 : 4 per mason per day is

(A) 1.5 m^3
(B) 2.5 m^3
(C) 3.5 m^3
(D) 5.0 m^3
Answer: Option D

Question No. 36

The value of '*C*' of Indian type W.C. shown in the given figure is:



(A) 400 mm
(B) 450 mm
(C) 500 mm
(D) 550 mm
Answer: Option C

Question No. 37

The area is measured correct to the nearest

(A) 0.01 sqm
(B) 0.02 sqm
(C) 0.03 sqm
(D) 0.04 sqm
Answer: Option A

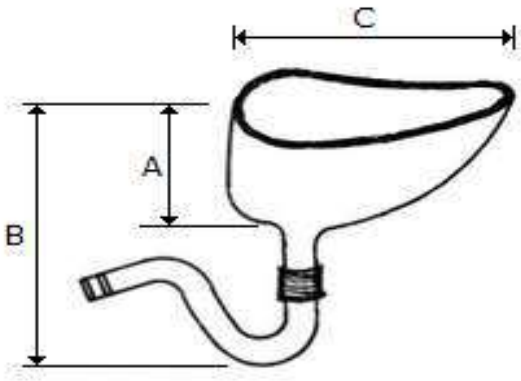
Question No. 38

The measurement is not made in square metres in case of

(A) D.P.C. (Damp proof course)
(B) Form works
(C) Concrete Jeffries
(D) R.C. Chhajja
Answer: Option D

Question No. 39

The value of '*A*' of Indian type W.C. shown in the given figure is:



(A) 25 cm
(B) 30 cm
(C) 40 cm
(D) 45 cm
Answer: Option B

Question No. 40

The trap which is provided to disconnect the house drain from the street sewer is called

(A) Master trap
(B) Intercepting trap
(C) Interception manhole
(D) All the above
Answer: Option D

Question No. 41

Due to change in price level, a revised estimate is prepared if the sanctioned estimate exceeds

(A) 2.0 %
(B) 2.5 %

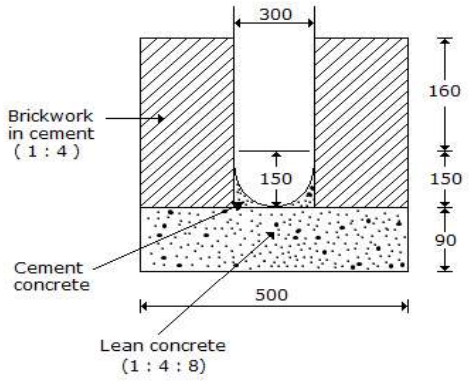
(C) 4.0 %

(D) 5.0 %

Answer: Option D

Question No. 42

The cost of the earthwork in excavation for the surface drain of cross-section shown in the given figure for a total length of 5 metres @ Rs. 450% cum, is



(A) Rs. 400

(B) Rs. 425

(C) Rs. 450

(D) Rs. 500

Answer: Option C

Question No. 43

The expected out turn of 2.5 cm cement concrete floor per mansion per day

(A) 2.5 sqm

(B) 5.0 sqm

(C) 7.5 sqm

(D) 10 sqm

Answer: Option C

Question No. 44

Pick up the correct statement from the following:

(A) The bent up bars at a support resist the negative bending moment

(B) The bent up bars at a support resist the sharing force

(C) The bending of bars near supports is generally at 45°

(D) All the above

Answer: Option D

Question No. 45

While preparing a detailed estimate

(A) Dimension should be measured correct to 0.01 m

(B) Area should be measured correct to 0.01 sqm

(C) Volume should be measured correct to 0.01 cum

(D) All the above

Answer: Option D

Question No. 46

The item of the brick structure measured in sq.m, is

(A) Reinforced brick work
(B) Broken glass coping
(C) Brick edging
(D) Brick work in arches

Answer: Option B

Question No. 47

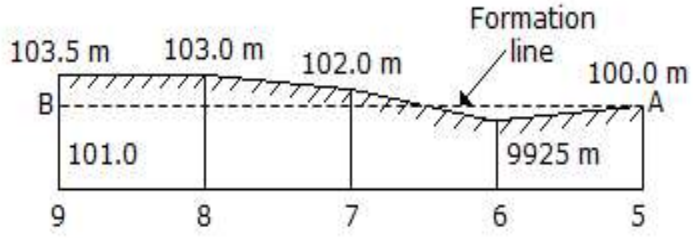
The most reliable estimate is

(A) Detailed estimate
(B) Preliminary estimate
(C) Plinth area estimate
(D) Cube rate estimate

Answer: Option A

Question No. 48

The reduced levels of points, 30 metres apart along the longitudinal section of a road portion between chainages 5 and 9 are shown in the given figure. If there is a uniform up-gradient of the road 120 in 1, the chainage of the point with no filling or cutting is



(A) (6 + 15) chains
(B) (6 + 12) chains
(C) (6 + 18) chains
(D) None of these

Answer: Option B

Question No. 49

According to ISI method of measurement, the order of the sequence is

(A) Length, breadth, height
(B) Breadth, length, height
(C) Height, length, breadth
(D) None of these

Answer: Option A

Question No. 50

Anti-siphonage pipe is connected to

(A) Main soil pipe
(B) Bottom of P trap W.C.
(C) Top of P trap W.C.
(D) Side of water closet

Answer: Option C

Question No. 51

Pick up the correct statement from the following:

(A) In a gully trap, a water seal of 6 to 7.5 cm is provided
(B) The gully trap collects waste water from the kitchen, sink, wash basins, etc.
(C) The gully trap disconnects the sullage drain from the main drainage system
(D) The grating provided over gully traps is 23 cm square

Answer: Option B

Question No. 52

Pick up the correct statement from the following:

(A) Bricks are paid per thousand
(B) Cement is paid per 50 kg bag
(C) Lime is paid per quintal
(D) All the above

Answer: Option D

Question No. 53

Pick up the correct statement from the following:

(A) All pipes and fittings are classified according to their diameters
(B) The diameter of the pipes is the nominal diameter of internal bore
(C) All pipes are measured along the centre line of the pipes in metres
(D) All the above

Answer: Option D

Question No. 54

A portion of an embankment having a uniform up-gradient 1 in 500 is circular with radius 1000 m of the centre line. It subtends 180° at the centre. If the height of the bank is 1 m at the lower end, and side slopes 2:1, the earth work involved.

(A) 26,000 m^3
(B) 26,500 m^3
(C) 27,000 m^3
(D) 27,500 m^3

Answer: Option D

Question No. 55

Pick up the correct statement in case of water supply.

(A) Pipes laid in trenches and pipes fixed to walls are measured separately

(B) Cutting through walls and floors are included with the item
(C) Pipes are classified according to their sizes and quality
(D) All the above
Answer: Option D

Question No. 56

The concrete work for the following part of the building of specified thickness is measured in square metres

(A) Root slabs
(B) Floors
(C) Wall panels
(D) All the above
Answer: Option D

Question No. 57

The expected out turn of 12 mm plastering with cement mortar is

(A) 2.5 sq m
(B) 4.0 sq m
(C) 6.0 sq m
(D) 8.0 sq m
Answer: Option D

Question No. 58

The total length of a cranked bar through a distance (*d*) at 45° in case of a beam of effective length *L*, is

(A) $L + 0.42\ d$
(B) $L + (2 \times 0.42\ d)$
(C) $L - (0.42\ d)$
(D) $L - (2 \times 0.4\ d)$
Answer: Option B

Question No. 59

The measurement is made for stone work in square metre in case of

(A) Wall facing
(B) Columns, lintels, copings
(C) Building work
(D) (a) and (d) of the above
Answer: Option D

Question No. 60

Carpet area does not include the area of

(A) The walls along with doors and other openings
(B) Bath room and lavatory
(C) Kitchen and pantry
(D) All the above

Answer: Option D

Question No. 61

Pick up the correct statement from the following:

(A) The incidental expenses of a miscellaneous character which could not be predicted during preparation of the estimate, is called contingencies

(B) Additional supervising staff engaged at work site, is called work charged establishment

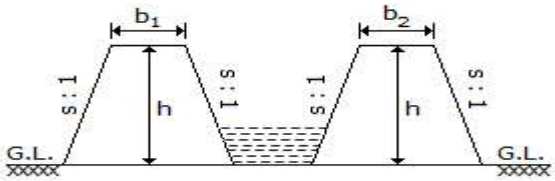
(C) Detailed specifications specify qualities, quantities and the proportions of materials to be used for a particular item

(D) All the above

Answer: Option D

Question No. 62

The cross-sectional area of the embankment of a canal fully in embankment in the given figure is



(A) $\frac{1}{2}(b_1 + b_2)\, h$

(B) $(b_1 + b_2)\, h + sb^2$

(C) $(b_1 + b_2) + 2sh^2$

(D) $2\,[(b_1 + b_2)\,(b + sh^2)]$

Answer: Option C

Question No. 63

The correct Prismoidal formula for volume is

(A) D [first area + last area + Σ Even area + 2 Σ odd areas]

(B) $D/3$ [first area + last area + 4 Σ Even area + 2 Σ odd areas]

(C) $D/3$ [first area + last area + 2 Σ Even area + 4 Σ odd areas]

(D) $D/6$ [first area + last area + 2 Σ Even area + 4 Σ odd areas]

Answer: Option B

Question No. 64

In case of laying gullies, siphons, intercepting traps, the cost includes

(A) Setting and laying

(B) Bed concreting

(C) Connection to drains

(D) All of these

Answer: Option D

Question No. 65

The inspection pit or chamber is a manhole provided in a base drainage system

(A) At every change of direction

(B) At every change of gradient
(C) At every 30 m intervals
(D) All the above
Answer: Option D

Question No. 66

Pick up the incorrect statement from the following:

(A) Dimensions are measured to the nearest 0.01 m
(B) Areas are measured to the nearest 0.01 sq.m
(C) Cubic contents are measured to the nearest 0.1 cum
(D) Weights are measured to the nearest 0.001 tonnes
Answer: Option C

Question No. 67

The 'centre line method' is specially adopted for estimating

(A) Circular buildings
(B) Hexagonal buildings
(C) Octagonal buildings
(D) All the above
Answer: Option D

Question No. 68

Pick up the incorrect statement from the following:

(A) The built up covered area at the floor level of any storey of a building is called plinth area
(B) The usable covered area of the rooms of any storey of a building is called carpet area
(C) The carpet area of a building along with area of its kitchen, pantry, store, lavatory, bath room and glazed veranda, is called floor area
(D) None of these
Answer: Option D

Question No. 69

The unit of measurement is per quintal for the following:

(A) Collapsible gates with rails
(B) Rolling shutters
(C) Expanded metal wire netting
(D) M.S. reinforcement of R.C.C. works
Answer: Option D

Question No. 70

The diameter of a domestic sewer pipe laid at gradient 1 in 100 is recommended

(A) 100 mm
(B) 150 mm
(C) 200 mm
(D) 175 mm
Answer: Option B

Question No. 71

The order of booking dimensions is

(A) Length, breadth, height
(B) Breadth, length, height
(C) Height, breadth, length
(D) None of these
Answer: Option A

Question No. 72

Pick up the incorrect statement regarding a master trap from the following:

(A) It is provided in between the lower end of the house drain and the street sewer
(B) It is provided a cleaning eye at the top of the trap
(C) The mica flap valve which opens inwards only, is fitted at the top of the inlet pipe
(D) The water seal is less than that of ordinary traps
Answer: Option D

Question No. 73

The area of a sloping surface of a protective embankment of mean height'd', side slopes *S*: 1 and length '*L*' is

(A) $d \times d \times s$
(B) $\sqrt{[d^2 \times (ds)^2]}$
(C) $L.D \sqrt{(1 + s^2)}$
(D) $2\ L.D \sqrt{(1 + s^2)}$
Answer: Option C

Question No. 74

The detention period in a septic tank is assumed

(A) 20 minutes
(B) 25 minutes
(C) 30 minutes
(D) 40 minutes
Answer: Option C

Question No. 75

If *B* is the width of formation, *d* is the height of the embankment, side slope *S* : 1, for a highway with no transverse slope, the area of cross-section is

(A) $B + d + Sd$
(B) $Bd + Sd^2$
(C) $B \times d - Sd^{1/2}$
(D) $½\ (Bd + Sd^2)$
Answer: Option B

Question No. 76

The ground surface slopes 1 in 50 along a proposed railway embankment 150 m in length. The height of the embankment at zero chainage is 0.5 m, the width is 11 m and side slopes 2:1. If the

falling gradient of the embankment is 1 in 150, the quantity of the earthwork calculated by Prismoidal formula, is

(A) 3250 m^3
(B) 3225 m^3
(C) 3275 m^3
(D) 3300 m^3
Answer: Option B

Question No. 77

Pick up the item of work not included in the plinth area estimate

(A) Wall thickness
(B) Room area
(C) W.C. area
(D) Courtyard area
Answer: Option D

Question No. 78

The minimum width of a septic tank is taken

(A) 70 cm
(B) 75 cm
(C) 80 cm
(D) 90 cm
Answer: Option B

Question No. 79

Pick up the item whose weight is added to the weight of respective item, is

(A) Cleats
(B) Brackets
(C) Bolts
(D) All the above
Answer: Option D

Question No. 80

The expected out turn for earth work in excavation in ordinary soil per workman per day is

(A) 1.00 cum
(B) 2.00 cum
(C) 3.00 cum
(D) 4.00 cum
Answer: Option C

Question No. 81

The expected out turn of brick work in cement mortar in foundation and plinth per mason per day, is

(A) 1.00 m^3
(B) 1.25 m^3

(C) 1.50 m^3

(D) 1.75 m^3

Answer: Option B

Question No. 82

The brick work is measured in sq metre, in case of

(A) Honey comb brick work

(B) Brick flat soling

(C) Half brick walls or the partition

(D) All the above

Answer: Option D

Question No. 83

The height of the sink of wash basin above floor level is kept

(A) 60 cm

(B) 70 cm

(C) 75 cm to 80 cm

(D) 80 cm

Answer: Option C

Question No. 84

For 12 mm thick cement plastering 1 : 6 on 100 sq.m new brick work, the quantity of cement required, is

(A) 0.200 m^3

(B) 0.247 m^3

(C) 0.274 m^3

(D) 0.295 m^3

Answer: Option C

Question No. 85

The item of steel work which is measured in sq.m, is

(A) Collapsible gates

(B) Rolling shutters

(C) Ventilators and glazing

(D) All the above

Answer: Option D

Question No. 86

The damp proof course (D.P.C.) is measured in

(A) Cub. m

(B) Sq. m

(C) Metres

(D) None of these

Answer: Option B

Question No. 87

The volume is measured correct to the nearest

(A) 0.01 cum
(B) 0.02 cum
(C) 0.03 cum
(D) 0.04 cum
Answer: Option A

Question No. 88

If tensile stress of a steel rod of diameter '*D*' is 1400 kg/cm^2 and bond stress is 6 kg/cm^2, the required bond length of the rod is

(A) 30 *D*
(B) 39 *D*
(C) 50 *D*
(D) 59 *D*
Answer: Option D

Question No. 89

For 100 sq. m cement concrete (1 : 2: 4) 4 cm thick floor, the quantity of cement required, is

(A) 0.90 m^3
(B) 0.94 m^3
(C) 0.98 m^3
(D) 1.00 m^3
Answer: Option B

Question No. 90

Size, capacity and materials need be specified for

(A) Bib-cocks
(B) Stop-cocks
(C) Ball valves
(D) All the above
Answer: Option D

Question No. 91

The expected out turn of half brick partition wall per mason per day is

(A) 1.5 m^3
(B) 2.0 m^3
(C) 4.0 m^2
(D) 5.0 m^2
Answer: Option B

Question No. 92

The floor area includes the area of the balcony up to

(A) 100 %
(B) 75 %

(C) 50 %

(D) 25 %

Answer: Option C

Question No. 93

The slope of the outlet of '*P* trap' below the horizontal is kept

(A) 8°

(B) 10°

(C) 12°

(D) 14°

Answer: Option D

Question No. 94

The weight of an item is measured correct to nearest

(A) 0.25 kg

(B) 0.50 kg

(C) 0.75 kg

(D) 1.00 kg

Answer: Option D

Question No. 95

Berms are provided in canals if these are

(A) Fully in excavation

(B) Partly in excavation and partly in embankment

(C) Fully in embankment

(D) All the above

Answer: Option B

TWO MARKS AND 16 MARKS QUESTION AND ANSWERS

ESTIMATION AND COST EVALUATION-I

1.Define analysis of rates**.**

Determination of rates of works from the qualities and cost of materials and labours required is termed as analysis of rates

2.Define a tender.

Tender is an offer given in writing to execute specified articles or materials at a certain rate, within a fixed time, under certain conditions of agreement between the contractor and the party, which may be a government department or an individual.

3.Define 'contract'

Contract is merely an agreement being enforceable by law between two persons or parties.

4.What are the types of culvert?

1. Arch culvert
2. Slab culvert
3. Pipe culvert
4. Box culvert

5.what are the methods of estimate?

1.Detailed estimate

2. Abstract estimate

6. What are the types of estimate?

1 Preliminary Estimate or Rough cost estimate

2. Plinth area estimate

3. Cube Rate Estimate or Cubical Content Estimate

4. Approximate Quantity Method Estimate
5. Detailed Estimate or Item Rate Estimate
6.Revised Estimate
7. Supplementary Estimate And Revised Estimate.
8.Annual Repair or Maintenances Estimate
9. Supplementary Estimate

7.Briefly explain about preliminary Estimate.

The estimate which prepared using any rough method to get the approximatecost construction anticipated in a project is called an approximate or rough estimate. Since this estimate is normally prepared in the preliminary estimate.

8.Estimate the quantities of brickwork and plastering required in a wall 4m long, 3m high and 30 cm thick. Calculate also the cost if the rate of brickwork is Rs.32.00 per cu.m and of plastering is Rs. 8.50 per sq.m

Quantities of brickwork = LxBxH
= 4m x 3m x 0.30m
= 3.6 cu.m

Quantity of plastering (two faces) = 2 x 4m x 3m
= 24sq.m

Cost of brickwork =3.6 x 320.00
= Rs.1152.00

Cost of plastering = 24x 8.50
= Rs.204.00

Total cost =1152.00 + 204.00
= Rs.1356.00

9. Define detailed estimate

The estimate, which provides the itemwise quantities of works, item wise unit rates and itemwise expenditure anticipated in thre project/construction, is called a detailed estimate

10. Define Abstract estimate

This is the third and final stage in a detailed estimate. The quantities and rates of each item of work, arrived in the first two stages, are now entered in an abstract form. The total cost of each item of work is now calculated by multiplying the quantities and respective rates.

11. Define quantity surveyor

A qualified or experienced person who does the above mentioned works (taking off, squaring, abstracting and billing) is called a quality surveyor

12. Write the duties of quantity surveyor**.**

- Preparing bill of quantities (Taking off, squaring, Abstracting and billing)
- Preparing bills for part payments at intervals during the execution of work.
- Preparing bill of adjustment in the case of variations ordered during the execution of work
- Giving legal advice in case of court proceedings

13. Write the essential qualities of a good surveyor**.**

- The quality surveyor must be well versed with the drawings of work.
- He should be able to read the drawing correctly and bill the quantities accurately
- He should have a through knowledge of the construction procedure to be adopted, the various items of works involved in the execution: and the different materials to be used in the work.
- He should be able to prepare schedule to be priced by tenderor.

14. What are the main components of culvert?

1.Abutments

2.Wing walls

3.Arch

15.What are factors to be considered in design of septic tank?

The following factors should be taken into consideration:

- Material should be water proof and corrosion resistant.
- Natural ventilation provided should be adequate
- A manhole should be provided to permit inspection and cleaning.
- Baffles should be limited to one at the inlet and one at the outlet.
- The escape of gas and sludge to effluent pipe should be avoided.

16.Define lead.

Lead is the crow flying horizontal distance from the centre of borrow pit to the centre of the earthwork at site, i.e centre of the area of excavation to the centre of placed earth.

17.Define lift.

Lift is the distance through which the excavated soil is lifted beyond a certain specified depth.

18. The actual expenditure incurred in the construction of a school building which have a total length of main walls 140m is Rs.4.97lakhs.Estimate the approximate cost of a similar school building which will have 180m length of main walls.

Total expenditure = Rs.4,97,000

Total length of main walls = 140m

Rate per m length of main wall = 4,96,000/140 = Rs.3550/-

Length of main walls in the proposed building = 180m

Approximate cost = 180 x 3550 = Rs.6,39,000/-

19. Write the formula for Mid ordinate rule and Prismoidal formula Rule.

Mid sectional area method:

$Q = (Bd_m + sd_m^2) \times L$

Where

B – Formation width

S – Side slopes

d_m – Mean depth

L – Length of the section

Prismoidal formula rule:

$Q = L/6(A_1 + A_2 + 4A_m)$

$A1 = Bd_1 + sd_1^2$

$A2 = Bd_2 + Sd_2^2$

$A_m = Bd_m + sd_m^2$

$d_m = (d_1 + d_2)/2$

20. Define estimate.

An estimate is a computation or calculation of the quantities required and expenditure likely to be incurred in the construction of a work. The estimate is the probable cost of a work and is determined theoretically by mathematical calculation based on the plans and drawing and current rates.

21. Write the recommendation for degree of accuracy in measurements.

- Dimensions of works shall be measured to an accuracy of 0.01 m
- Thickness of R.C works shall be measured to an accuracy of 0.0005 m
- Areas of works shall be calculated to the nearest 0.01 m^2
- Volumes of work shall be calculated to the nearest 0.01 m^3
- Volumes of wood shall be calculated to the nearest 0.001 m^3

22. Briefly explain about revised estimate

The estimate, which is prepared

- When any major change or alteration is made in the plan / structural arrangement, with or without affecting the estimate cost, and

When the estimated cost is likely to exceed by more than 5% during execution, due to increase in the cost of materials and labour or due to increase in the cost of materials and labour or due to alterations in the items of works to get the revised quantities /rates/ amount is called a revised estimate

23. Calculate the quality of brickwork in an arch over a 1.80m span opening. The arch is

40cm.thick and the breath of a wall is 40 cm.

Radius of the arch =1.8m Thickness of arch = 40 cm

The breath of wall = 40cm Mean dia = 3.60+0.40 = 4 m

Mean length of the arch given = 1/6 *(22/7)* 4 = 2.1m

Quantity of brickwork = 2.1*0.40*0.4 = 0.34cu.m

No of bricks required = 0..34cu.m @ 550 bricks per cu.m = 187

24. Define Floor area

It defined as covered area i.e plinth area excluding area of walls (generally 10% - 15 %) sills of the doors are not included in floor area. The floor area of very storey shall be measured separately.

25. Define Carpet area

This means area in a building which is useful one i.e area of drawing room, dining room bedroom etc. Areas of kitchens, staircase, stores, verandahs, entrance hall, bathroom, basement etc. are excluded. It is generally 50% to 60% of the plinth area.

26. Define Plinth area

It is defined area of a building measured at floor level. It is measured by taking external dimensions excluding plinth offset if any.

27. What are the methods of taking out estimates?

- Centre line method
- Crossing method
- Out to Out and in to in method
- Bay method
- Service unit method

28. Briefly explain about Out to Out and in to in method.

This method is most practicable under all circumstances and is generally followed in the P.W.D for computing the quantities of various items.

29. Briefly explain about bay method.

This method is useful and is generally followed in case of buildings having several bays. The cost of the typical bay is worked out and is then multiplied by the number of bays in that building. The extra cost for the end walls and difference in framing, if there is any, should be made, so as to arrive at the correct cost

30. Workout the quality of stone metal required for 2Km.Length for wearing coat of a 4m wide road. The thickness of the metal road required is 12cm loose.

Solution

Quality of metal = 1 X 2 X 1000 X 4 X 0.12 = 960.00cu.m

31. An approach road 2Km.long is to be constructed. Work out the quantity of materials required i.e. stone metal and bricks. Data is given below.

Length = 2 Km

Metalled width = 3.60m

Soiling of bricks = 10cm

Wearing coat of stone metal = 12 cm

Solution

Quantity of bricks = 1 x 2 x 1000 x 3.60 x 0.10 = 720 cu.m

No of bricks = 720.0 x 3.60 x 0.12 = 3,60,000

Stone metal = 1 x 2000 x 3.60 x 0.12 = 864 cu.m

Bricks = 3,60,000 Nos

32. A cement concrete road (1:2:3) is to be constructed over the existing water bound macadam road .The thickness of slab =10cm.The length of the road is one km and the width 3.60m.Calculate the quality of cement concrete and the material required,

Solution

Quality of cement concrete = 1 x 1000 x 3.60 x 0.10 = 360 cu.m

33.Calculate the quality of earthwork for the construction of an approach road

Length = 1Km

Width of formation = 10 m

Height of embankment = 60 cm

Side slope = 1:2

Solution

Quantity of earth work = L ($Bd+Sd^2$)

B=10cm ; d =0.60m ;S = 2

Quantity of earth work = 1000 x (10 x 0.60) +2 x 0.60 x 0.60 = 6720 cu.m

34.What are the methods of measurements of earthwork?

The work shall be measured as given below

- Each dimension shall measured nearest to 0.01
- Area shall be worked out nearest to 0.01 m^2
- Volume shall be worked out nearest to 0.01 m^3

35.write the essentials requirements of contract.

- There must be an offer of one party, and its acceptance by the other party to make an agreement.
- There must be an intention of both the parties to create legal relation.
- The object of the contract must be legal, and it must not be opposed to any policy of the government or company.
- The agreement to make a contract should be supported by consideration, or recongnised by law.

36.what are the types of contract?

1. Lump-sum contract
2. Cost plus percentage of cost contract
3. Item rate contract
4. Labour contract
5. Integrated contracting system

37. what are the important legal implications of a contract?

- Agreement should not violate the provisions of law.
- It should not have any adverse effect on the morals of the society
- The form of contract should be in writing and each page of the documents of the contract should of the contract should be signed by both the parties.
- A contractor who refuse to carry out the work before completion can be sued in a court of law for breach of contract.

38. What is specification?

Specification is an important document attached with a tender form/contract agreement, which in most cases controls the quality of materials and works.

39. State the different types of specification**.**

1. General or brief specification
2. Detailed specification
3. Standard specification

40. Describe general or brief specification

General specification gives the nature and class of work and materials in general to be used in the various parts of the works, from the foundation to the superstructure.

General specifications give idea of the whole work or structure and are useful for preparing the estimate.

41. Describe detailed specification

The detailed specifications form a part of the contract document. The detailed specification of an item of the work specifies the qualities and quantities of materials proportion of mortar workmanship, the method of preparation and execution and method measurement.

The detailed specifications of different items of work are prepared separately which description what the work should be and how they should executed and constructed.

42. What are the types of penalties that are imposed on a contract and why are they imposed?

Penalties may be imposed for non-fulfillment of conditions of contract such as not maintaining progress, deley in completion and unsatisfactory work etc. The penalty may be fixed sum per day or a percentage of the estimated cost upto 10%

43. What is arbitration?

Arbitration means the settlement of a dispute by the decision of a third person chosen and acceptable as a judge. The decision of the arbitrator is binding on both the parties. In public works department the superintending engineer function as the arbitrator

44. Why and when the earnest money deposit are collected?

While submitting a tender, the bidder has to deposit with the department an amount equal to about 2 ½% of the estimated cost of the work which is called earnest money deposit. This amount serves as a check to prevent the contractor from refusing to accept the work or runway, when his tender has been accepted. In case of refusal to take up the work his earnest money is forefeied.

45. Why and when the security deposit are collected?

At the time of execution of the contract agreement, the successful tender has to deposit a further sum of 1% of the contract amount to the department. This amount is known as security deposit. This amount is kept as a check so that the contractor fulfils all terms and conditions of the contract. The security deposit will be refunded to the contractor on the satisfactory completion of the whole work, after the observation period of 6 months

46. What is a tender notice?

Tender notice is the publicity of offer to the contractor to quote their rates for construction for construction work or supplied. Sealed tenders are invited in the most open and public manner. It is made public by advisement in leading newspaper, in the government gazette or by notice in English and in the regional languages in public places.

47. What informations should a contract document contain?

1.Title page

2.Index page

3.Tender notice and tender forms

4.Schedule of quantities

5.Drawings

6.General specifications

7.Detailed specification

8.Schedule of issue of materials

9.Conditions of contract.

48. Define valuation

Valuation is the process of estimating the cost of a property based on its present condition. The properties may be immovable properties like land, buildings, mines trees quarries etc., and movable properties such as coal, oil, steel, cement, sand etc.

49. What are the important factors influencing the value of building?

1. Type of the building
2. Location of the building
3. Expected life of the building
4. Size and shape of the building
5. The Present condition of the building
6. Legal control of the building

50. What is the purpose of valuations?

1. For assessment of wealth tax, property tax etc
2. For fixation of rent
3. For security of loans or mortgage
4. For insurance, betterment charges etc
5. For compulsory acquisition
6. For reinstatement.

51. Define Floor rate.

It is the ratio between the total built up area (Plinth area) of all floors and the area of the plot.

Floor Area Ratio = Total Plinth area of all floors / Plot area

52. Define Plinth area rate.

It is the ratio between the total present cost of a particular type of building and its plinth area.

Plinth area rate = Total present cost of a building/ plinth area.

53. A property fetches a net income of Rs.900.00 deducting all outgoings. Workout the capitalized value of the property if the rate of interest is 6% per annum.

Year's purchase = 100/6 = 16.67

Capitalized value of the property = net income x Y.P

= 900 x 16.67

= Rs.15003.00

54. Find the plinth area required for the residential accommodation for an assistant Engineer in the pay scale of Rs.400.00 to 1,000 per month.

Average pay = 400+1000 /2 = Rs.700/month

Average month rent @10% of salary = 700.00/10 = Rs.70.00

Average annual rent 70.00 x 12 = Rs. 840.00

Capital cost of the building @ 6% interest = 840 x 100 / 6 = Rs.14000.00

Plinth area required @ Rs.150.00 per sq.m of plinth area

= 14000/150 = 93.33sq.m

Normally the quarters for the assistant engineer should be constructed at the cost of Rs.14000.00 having plinth area of 93.33 sq.m.

But due to the increase in the cost of construction, this may be increased by 100% and the capital cost of construction may be fixed as Rs.28,000.00 and the approximate plinth areas of 93.33

55. A pumping set with a motor has been installed in a building at a cost Rs.2500.00.Assuming the life of the pump as 15 years, workout the amount of annual installment of sinking fund to be deposited to accumulate the whole amount of 4% compound interest**.**

The annual sinking fund $I = Si/(1+i)^n - 1$

$= 2500 \times 0.04 /(1+0.04)^{15} -1 = Rs.125$

The owner is to deposit Rs.125/-annually in 4% compound interest carrying investment for 15 years to accumulate Rs.2500/-

56. An old building has been purchased by a person at a cost of Rs.30,000/- excluding the cost of the land.Calculate the amount of annual sinking fund at 4% interest assuming the future life of the building as 20 years and scarp value of the building as 10% of the cost of purchase.

The total amount of sinking fund to be accumulated at the end of 20 years

$S = 3000x (90/100) = Rs.27000.00$

Annual installments of sinking fund $I = Si/(1+i)^n - 1$

$= 27000 \times 0.04 /(1+0.04)^{20} -1 = Rs.907.20$

Annual installments for sinking fund requires for 20 years = Rs.907.20

57. Write the necessity of valuation.

- Rent fixation. It is generally taken as 6% of the valuation of the property
- For buying and selling
- Acquisition of property by Govt.
- To be mortgaged with bank or any other society to raise loan
- For various taxes to be given and fixed, by the Municipal Committee
- Insurance: For taking out on insurance policies.

58. Define the Value :

Value-Present day cost of a engineering structures (saleable value)

59. Define the Cost:

Original cost of construction. It is used to find out the loss of value of property due to various reasons.

60. Define the Gross income:

Total amount of the in come received from the property during the year, without deducting outgoings

61. Define the Net come:

An amount left at the end of the year after deducting all useable outgoings

62. Define the Obsolescence:

The value of property decreases if its style and design are outdated i.e rooms not properly set, thick walls, poor ventilation etc. The reason of this is fast changing techniques of construction, design, ideas leading to more comfort etc.

63. Define the Scrap Value:

Scrap Value: If a building is to be dismantelled after the period its utility is over, some amount can be fetched from the sale of old materials. The amount is known as scrap value of a building. If various from 7% to 10% of the cost of construction according to the availability of the material.

64. Define the Salvage value

If a property after being discarded at the end of the utility period is sold without being into pieces, the amount thus realized by sale is known as its salvage value.

65. Define the Capitalized value:

It is defined as that amount of money whose annual interest at the highest prevailing rate will be equal to the net income received from the property. To calculate the capitalized value, it is necessary to know highest prevailing on such properties and income from the property.

66. Define sinking fund.

A fund which is gradually accumulated and set aside to reconstruct the property after the expiry of the period of utility is known as sinking fund. The sinking funds may be found out by taking a sinking fund policy with any insurance company or deposition some amount in the bank. Generally while calculating the sinking fund, life of the building is considered. 90 % of the cost of construction is used for calculations 10 % is left out as scrap value.

sinking fund (I) = $Si/ (1+i)^n -1$

Where I = Annual instalment required

n = Number of year required to creat sinking fund

i = Rate of interest expressed in decimal i.e 5% as 0.05

S = Sinking fund

67. Define Market value

Market value: The market value of a property is the amount, which can be obtained at any particular time from the open market if the property is put for sale. The market value will differ from time to time according to demand and supply.

68. Define Book value

Book value: Book value is the amount shown in the account book after allowing necessary depreciations. The book value of a property at a particularly year is the original cost minus the amount of depreciation up to the previous year.

69. Write the various methods of valuation.

1.Plinth area method

2.depreciation rate method

3.Rental method

4.Land and building method

5.Development method

70.The estimated value of a building is Rs.5,00,000.The carpet area of the building is 70 sq.m If the plinth area is 20% more than this ,what is the plinth rate of the building?

Value of building = Rs.5, 00,000

Carpet area = 70 m^2

Plinth area = 20 % more = 1.20 x 70 = 84 m2

Plinth area rate of the building = Value of the building/Plinth area

= 5,00,000/84 = Rs.5952.38m^2

71. The present value of a property is 20000/- Calculate the standard rent. The rate of interest may be assumed as 6%.

Annual rent @ 6% = 20000x 6 /100 = Rs.1200/-

Standard rent per month = 1200/12 = Rs.1200/12 = Rs.100/-

72. Write the various methods of depreciation

1.Straigth line method

2.Constant percentage basis

3.Quantity survey method

4.Sinking fund method.

73. Define the Year's purchase

Year's purchase : It may be as the figure which when multiplied by the net income from a property gives capitalized value of the property.It can also be defined as "a certain amount of capital whose annuity of Rs.1/- at a certain rate of interest can be received"

Year's purchase = 100/rate of interest = 1/i

74. Define the Annuity

Annuity : The return of capital investment in the shape of annual installments monthly, quarterly, half yearly &yearly.

75. Define Analysis of work:

The process of determining the rate of an item of work or supply of the material is known as the analysis of rate or rate analysis.

76. What is the size of septic tank for 50 users?

4 cum

77. What is the size of septic tank for 25 users?

2.5 cum

79. Define contract:

The contract is an under taking by a person or firm to do any work under certain terms and condition

80. Define Contractor:

A person or a firm who undertakes any type of contract is termed as contractor.

81. Define Tender:

Tender is a written offer submitted by the contractors in pursuance of the notification given to execute certain work under certain terms and conditions.

82. What are the Essentials of contract:

The contract language is law full .

The contract is made by parties competent to contract.

The contract is made by free consent of the parties.

The contract is made under valid consideration.

There shall be a definite proposal and its acceptance.

83. What are the type of contract?

1. Item rate contract

2. Percentage rate contract

3. Lump-sum contract

4. Material supply contract

84. What are type of termination of contract?

Agreement

Breach

Performance

Impossibility of performance

Operation of provision of law

85. What are the conditions of contract?

Conditions relating to documents

Conditions relating to the execution of work

Conditions relating to labour and personal

86. Define Engineer:

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.

87. Define Owner:

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

88. Define Site:

Site means the place where the work is to be executed

89. Define Drawings:

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

90. Define work:

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

91. What is called Tender Notice?

The notice inviting tender is called tender notice.

92. Define Specification:

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

93. What are the object of specification?

1. Quality

2. Instruction

3. Aim of the project

94. What are the types of specifications?

1. Brief Specification.

2. General specification.

95. Define Arbitration:

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.

96. Define Arbitrators:

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

97. What are the types of Arbitration?

1. Arbitration with out intervention of court.

2. Arbitration with intervention of court and thre is no suit pending

3. Arbitration is suits.

98. 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.

99. Define Net income:

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

100. Define Capital cost:

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

16 MARKS

1. Explain various types of estimate

2. What are the various methods of estimate

3. Estimate single room,double room and multiple room building by long wall and short wall method and centre line method.

4. Analyses the rate of cement concrete,brick masonry in cement mortar,laterite stone masonry in cement mortar,cement plaster,white washing,artificial stone flooring,conc.flooring,rcc with centering and shuttering etc as per OPWD.

5. What are the types of contract?

6. Explain about Arbitration?

7. Explain the methods of valuation?

8. What are the procedures to be followed in opening of tender and security of tender?

9. What are the different types of contracts? Explain them briefly.

10. Explain in detail about the penalties to contractors.

11. Explain the procedure of opening the tenders, acceptance of tenders and the execution of agreement for carrying out a work.

12. Write note on i General or brief specification

ii Detailed specification

iii Standard specification