## 6th Sem./CIVIL/ 2022(S) OLD

## CET-604   Estimation and Cost Evaluation-II

Full Marks: 70

Time- 3 Hrs

Answer any five Questions including Q No.1& 2

Figures in the right hand margin indicates marks

1.      Answer **All**  questions                                                   2 x 10

   a.   What do you mean by span of a culvert?

   b.   Enlist different types of fall.

   c.   What do you mean by lead and lift?

   d.   What is NIT?

   e.   Differentiate between store and stock.

   f.   What is drainage  syphon?

   g.   If R.L of formation at $10^{th}$ chainage is 107.00 and upward gradient 1 in 150,then find out the R.L of formation of $11^{th}$ chainage?Length of the chain is 30mt.

   h.   What is pre tender Planning?

   i.   Mention the function of coping and kerb in a culvert.

   j.   What do you mean by banking and cutting?

2       Answer **Any Six** Questions                                              6X5

   a    Estimate the quantity of earthwork in excavation in foundation of drainage syphon from figure 1.

   b    Estimate the quantity of $1^{st}$ class brick work  in 1:6 cement sand mortar of hume pipe culvert from figure 3.

c   The dimensions of a RCC slab are 4.00m x 5.00m x 12cm deep. Reinforcement of 12 mm dia rods are placed in short span @ 15 cm c/c of the total number of rods, 17 numbers have been cranked and hooked at the ends. Other rods are straight and hooked at the ends. The 12 mm dia rod weight 0.89 kg per meter. To hold the cranked portion 4 numbers 10 mm dia straight and hooked rods have been used. The 10 mm dia rods are placed in a direction of long span @ 20 cm c/c and all are straight and hooked at ends. The 10 mm dia rods weight 0.62 kg/m. The covers are 1.8 cm at the bottom and 2.5 cm on all sides. Assume any other dimension not given. Estimate the total weight of steel required for reinforcement of the slab.

d   Calculate the area of the side slopes of portion of a bank for a length of 200 meter, the heights of banks at the two ends being 2.50 m and 3.50 m and the ratio of the side slope 2 : 1.
If the side slopes are to be provided with 15 cm thick stone pitching, calculate the cost of pitching at the rate of Rs. 200/- per cu m.

e   Briefly explain Administrative Approval and Technical sanction.

f   Find the area of permanent and temporary land required for a state highway of 1 km length having permanent land width of 30m, formation width of 10m,average height of bank 1.5m and depth of borrow pit 30cm.Assume side slope 2:1.

g   Estimate the quantity of earthwork in excavation of crest wall, side wall and floor taken together of 60 cm fall  from figure 2.

3   Prepare a detailed estimate for earthwork for a portion of a road from the following data          10
Formation width of road is 10m, side slope 2:1 in banking and 1½:1 in cutting.

| Distance in m | 0 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R.L of ground | 114.50 | 114.75 | 115.25 | 115.20 | 116.10 | 116.85 | 118.00 | 118.25 | 118.10 | 117.80 | 117.75 | 117.90 | 119.50 |
| R.L of formation | 115 | | | | | | | | | | | | |
| | Upward gradient 1  in 200 | | | | | | Downward gradient 1in 400 | | | | | | |

4   Write short notes on                                                                                            5X2
(i)  Special Repair and Annual Repair
(ii) Earnest money and security deposit.

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5      Estimation the items involved for construction of a WBM road from the following data:      10

     Length of road =1000m.

     Formation width =10m.

     Metalled width =3.8 m.

     Thickness of grade-I metal solving = 120mm.

     Wearing coat of grade-II metal 12 cm thick loose and 8cm thick compacted surface to be finished with 2 coats of bitumen as given below:

     First finishing coat = 13.2 mm chips @ 0.017 $m^3$ and bitumen @ 1.2 kg per $m^2$ of road surface.

     Second finishing coat = 6 mm chips @ 0.02$m^3$ and bitumen @ 1.24 kg per $m^2$ of road surface.

     Consumption of fuel @ 0.35 kg per kg of bitumen


6      Estimate the following quantities of items      5X2
     (i) Cement pointing in 1:3 cement mortar from figure 1.
     (ii) Cement pointing in 1:2 cement mortar from figure 3.

7      (i) Estimate the quantity of $1^{st}$ class brick work in 1:4 cement mortar from figure 2.      5X2
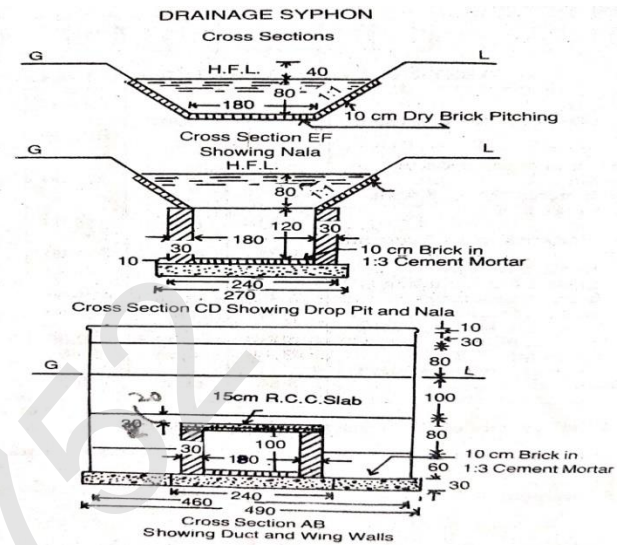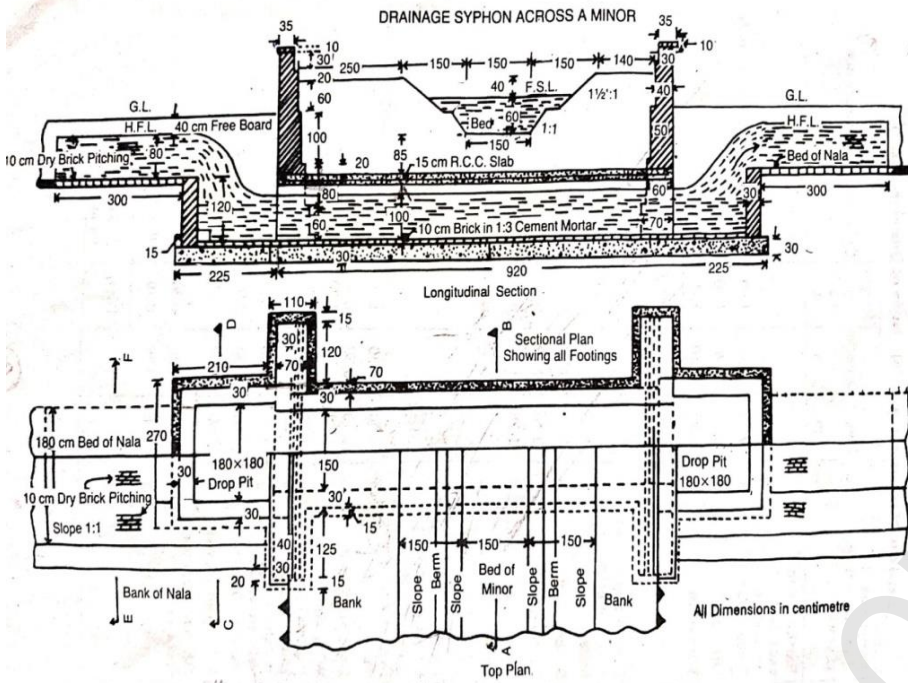     (ii) Estimate the quantity of brick pitching from figure 1.

**Fig 1**



All Dimensions in centimetre                    Half Top Plan

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**Fig 2**



PIPE CULVERT

CROSS SECTION XY OF WING WALL

HALF SECTIONAL ELEVATION ON ABCD

LONGITUDINAL SECTION

10 meter ROADWAY

20cm. Metaling

Earth Filling

Collar Joint

60 cm Dia Pipe

50cm.

TOP PLAN SHOWING PORTION BELOW GROUND DOTTED

Turn Wall

Wing Wall

Face Wall with Parapet above

SECTIONAL PLAN

Collar Joint

10 metre Road Way

TOP PLAN

FOUNDATION PLAN

Plan

All Dimensions in Centimetre

**Fig 3**

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