Code : 101604

B.Tech 6th Semester Exam., 2022

(New Course)

ENGINEERING ECONOMICS, ESTIMATION
AND COSTING

Time : 3 hours   Full Marks : 70

Instructions :

(i) The marks are indicated in the right-hand margin.

(ii) There are **NINE** questions in this paper.

(iii) Attempt **FIVE** questions in all.

(iv) Question No. **1** is compulsory.

(v) Assume any data not given.

1. Choose the correct answer of the following (any *seven*) :   2×7=14

    (a) What is the reduction in the money value of capital asset called?

       (i) Capital expenditure

       (ii) Capital loss ✓

       (iii) Loss

       (iv) Deficit

(2)

(b) Current assets less inventories divided by current liabilities is known as

   (i) liquidity ratio

   (ii) current ratio

   (iii) acid-test ratio ✓

   (iv) debts ratio

(c) The interest calculated on the basis of 365 days a year, is known as

   (i) interest

   (ii) exact simple interest ✓

   (iii) ordinary simple interest

   (iv) None of the above

(d) In what method of computing depreciation where it assumes that a sinking fund is established in which funds will accumulate for replacement purposes?

   (i) Straight line method

   (ii) Sum-of-year method

   (iii) Sinking fund method ✓

   (iv) Declining balance method

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

(i) 2·0%

(ii) 2·5%

(iii) 4·0%

(iv) 5·0%

(f) The value of a property, without being dismantled at the end of the useful life, is known as

(i) book value

(ii) write of value

(iii) junk value

(iv) None of the above

(g) The damp proof course (DPC) is measured in

(i) cu.m.

(ii) sq.m.

(iii) meters

(iv) None of the above

(h) Carpet area does not include the area of

(i) the walls along with doors and other openings

(ii) bathroom and lavatory
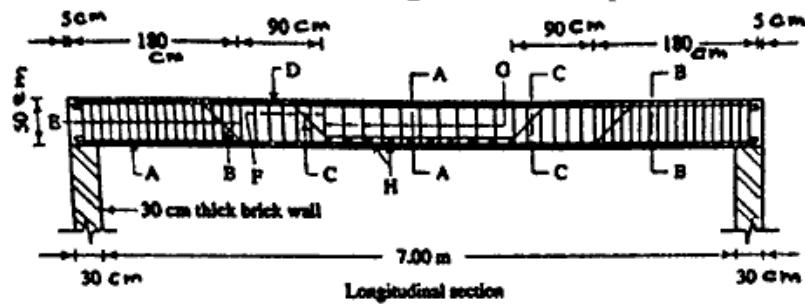
(iii) kitchen and pantry

(iv) None of the above

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

(i) breadth of the wall

(ii) half breadth of wall on each side

(iii) one-fourth breadth of wall on each side

(iv) None of the above

(j) A leases land to B on condition that he shall walk a hundred miles in an hour. The lease is called

(i) valid

(ii) void

(iii) legal

(iv) None of the above

2. Explain the effect of aggregate demand and supply over the engineering economics. What is the importance of price escalation consideration in estimation of structures? Prepare a detailed estimate of RCC beam (Fig. 1) with bar bending schedule and calculate the total weight of steel required : **14**

Longitudinal section

Type	Dia. (mm)	Type of Bar	Nos./Spacing	Wt. (kg/rm)
A	20	Straight	3	2·46
B	16	Bent-up	2	1·58
C	16	Bent-up	2	1·58
D	12	Straight	2	0·89
E	10	Stirrups	10 cm c/c	0·62
F	8	Stirrups	15 cm c/c	0·39
G	6	Stirrups	20 cm c/c	0·22
H	20	Spacer	21 cm c/c	2·46

Section AA

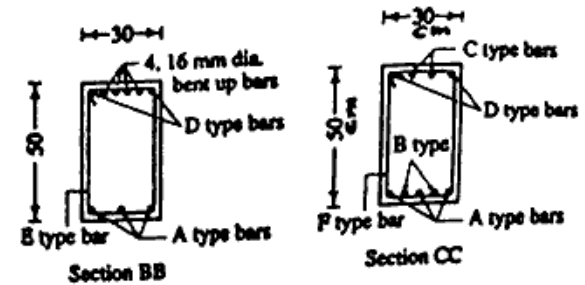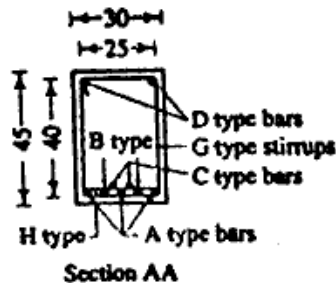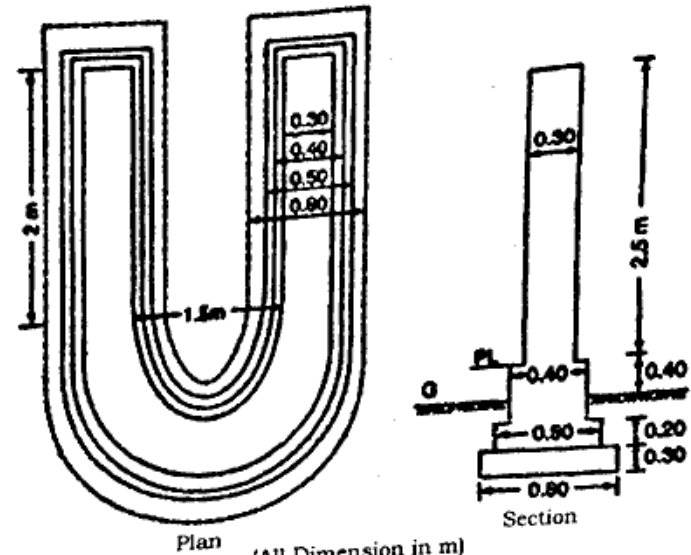(Turn Over)

Section BB   Section CC

Fig. 1

3. Explain the structure of productive activity in terms of Indian economy. What do you mean by fiscal sector economy? What is the Act corresponding to minimum wages? Find out the earthwork, cement concrete work in foundation $1 : 8 : 16$ and brickwork in cement mortar $1 : 5$ in foundation and plinth and superstructure as shown in Fig. 2 : **14**

Plan   (All Dimension in m)   Section

Fig. 2

(Continued)

4. Explain the application of linear programming in economics. What is the impact of monetary and fiscal policy tools on the economy? What is called security deposit? What do you mean by lead and lift in earthwork estimation? Estimate the quantity of earthwork for 200 metres length for a portion of a road in a uniform ground. The heights of banks at the two ends are 1·0 m and 1·6 m, respectively. The formation width is 10 metres and side slopes 2 : 1 (horizontal : vertical). Assume that there is no transverse slope. 14

5. State the requirements of an estimate. List the factors to be considered while preparing detailed estimate and explain briefly. Estimate the quantities of different items of works for an abutment with wing walls of culvert bridge as shown in Fig. 3. 14

(a)

Plan of Abutment and Wingwall

(b)

Wingwall
X Section at AA

Abutment
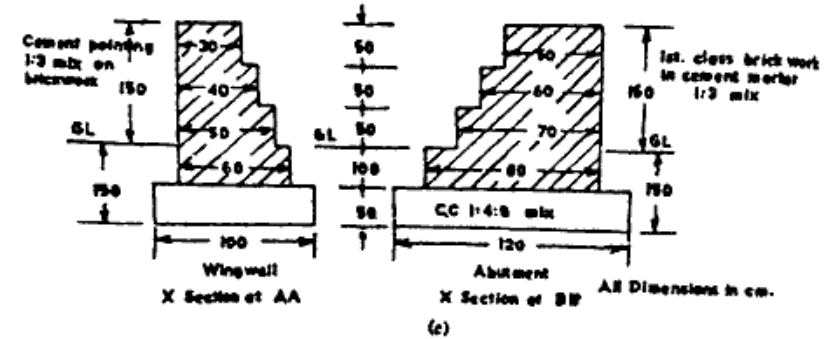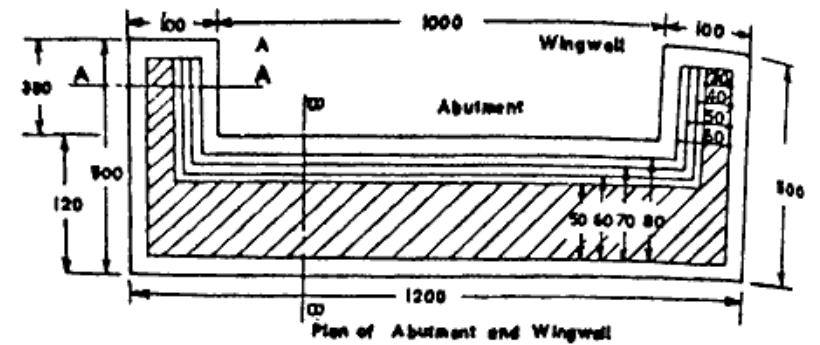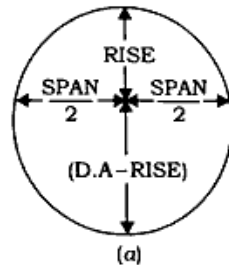X Section of BB

All Dimensions in cm.

(c)

Fig. 3

6. Explain the various features of BIM in estimation. What do you mean by liquidated damage? What is called sinking fund? Calculate the quantities of materials required for the following items of work and work out the rates per unit of work : 14

   (a) I-class brickwork in foundation and plinth with $20 \times 10 \times 10$ cm bricks with cement sand mortar 1 : 6

   (b) 12 mm thick cement plastering 1 : 6 in wall

(c) 2·5 cm thick cement concrete floor 1 : 2 : 4 (cement : sand : stone ballast)

The labourers required for the above works are categorized as follows :

(a) Head mason—1/2 nos., Mason—7 nos., Mazdoor—7 nos., Coolie—7 nos., Water-man—7 nos. https://www.akubihar.com

(b) Head mason—1/3 nos., Mason—10 nos., Mazdoor—15 nos., Water-man—3/4 nos.

(c) Head mason—3/4 nos., Mason—10 nos., Mazdoor—5 nos., Coolie—5 nos., Water-man—5 nos.

The rates for different materials and labourers are as follows :

(a) (i) Brick ballast—₹500/cu. m; (ii) White-lime—₹800/cu. m; (iii) Surkhi—₹450/cu. m; (iv) Stone ballast—₹1,000/cu. m; (v) Sand—₹500/cu. m; (vi) Cement—₹7,000/cu. m; (vii) I-class brick—₹2,500/% nos.

(b) (i) Head mason—₹700/day; (ii) Mason—₹600/day; (iii) Mazdoor—₹400/day; (iv) Coolie—₹200/day; (v) Water-man—₹150/day

(c) Miscellaneous expenses—₹500 as lump sum.

7. Explain the factors which affect the analysis of rate. What do you mean by out-turn work? What is called overhead expenses? Determine the rate of centering and shuttering and form work for RCC beam of 8 m length and size (60 cm depth and 30 cm breadth). The rate of timber is ₹15,000/- per cu.m. and the rate of prop. is ₹45 per rm. Consider, labourers as follows :

(a) Head mason—1/8 nos.

(b) Carpenter—2 nos.

(c) Mazdoor—3 nos.

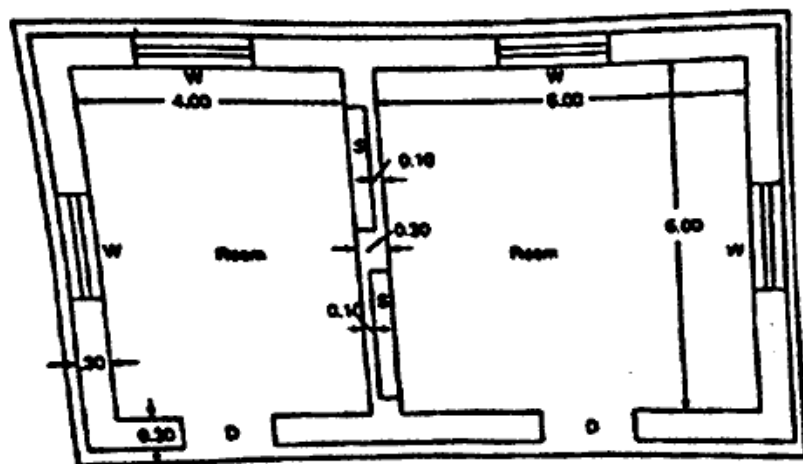Consider lump sum amount of ₹500/-

The rates of labourers are as follows :

(a) Head mason—₹700/day

(b) Carpenter—₹600/day

(c) Mazdoor—₹400/day

14

8. What is the importance of specification? Write general specifications of a First Class building. What do you mean by arbitration? Determine (i) earthwork in excavation in foundation, (ii) lime concrete in foundation, (iii) 1st class brickwork in cement mortar (1 : 4) in foundation and plinth of a two-roomed building (Fig. 4). 14

Plan (a)

Doors : D = 1.20 × 2.10
Windows : W = 1.00 × 1.50
Shelves : S = 1.00 × 1.50

7.5 cm Lime Concrete
15 cm R.C.C. Slab
2.6 cm Cement Conc. 1 : 2 : 4
2.5 cm D.P.C. 1 : 2 : 4 Cement conc.
10 cm Cement Conc. 1 : 5 : 10
Sand Filling 10 cm
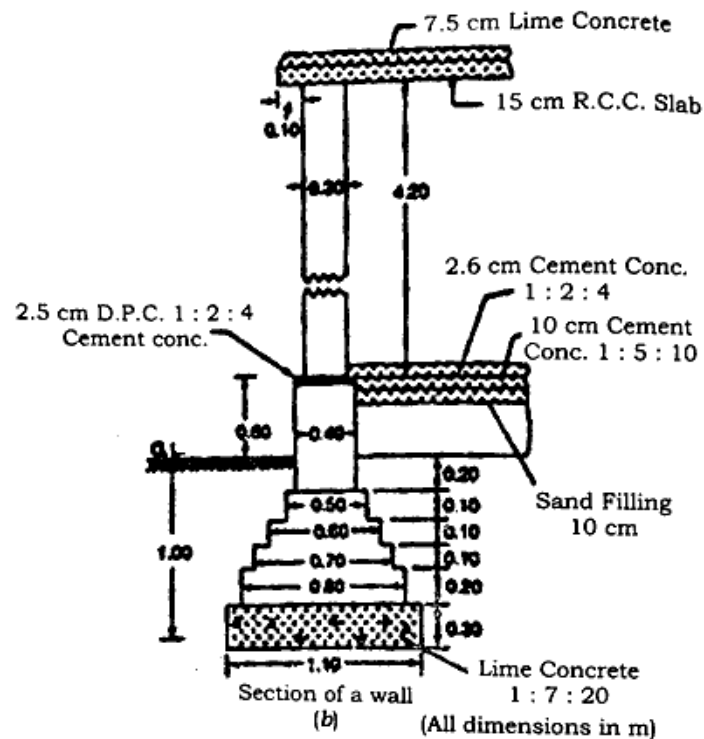Lime Concrete 1 : 7 : 20
Section of a wall
(b) (All dimensions in m)

Fig. 4

9. What is a contract? Explain different types of contract. Write the advantage and disadvantage of item rate contract. What do you mean by an unbalanced tender? Explain with an example. An asset was purchased at ₹ 15,000. If the scrap value of the same is ₹ 1,500/- after 6 years, calculate depreciation for each year adopting (a) straight line method, (b) constant percentage method and (c) sinking fund method (interest rate of 6%). 14

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