4E4111

Roll No. _____ Total No of Pages: 7

4E4111

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016

Civil Engineering

4CE1A Strength of Materials-II

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks (Main & Back): 26

Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

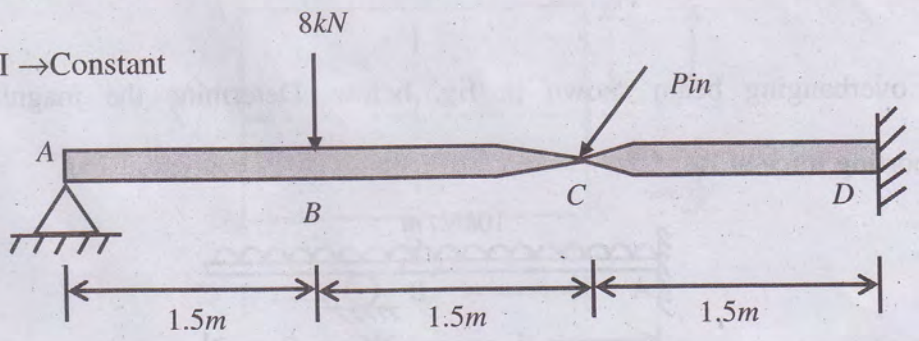
Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

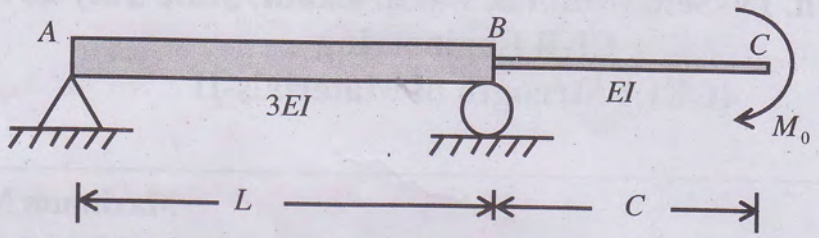
1. NIL 2. NIL

UNIT-I

Q.1 (a) Determine the deflection of point B for beam and loading shown below. Beam AC is simply supported at A and at C is pinned to a cantilever beam CD. [8]

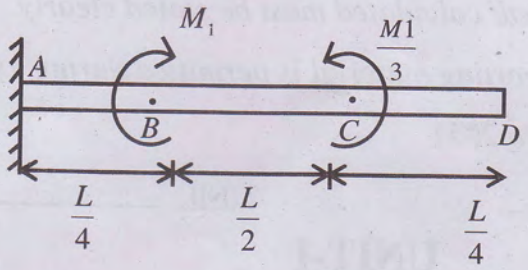


(b) For Beam ABC and loading shown in fig below, calculate deflection at free end C. Flexural rigidity for beam AB is 3EI and for BC is EI. [8]



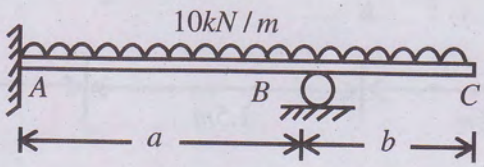
OR

Q.1 The cantilever beam AD is loaded by the applied couples M_1 and $M_1/_3$ as shown in fig below. Determine the equation of the deflected beam & deflection at D. [16]



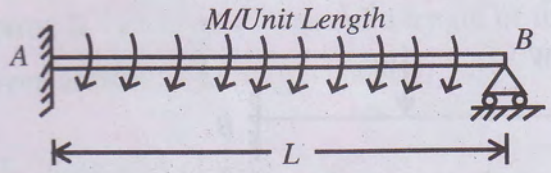
UNIT-II

Q.2 For overhanging beam shown in fig. below. Determine the magnitude of the supporting force at B. [16]



OR

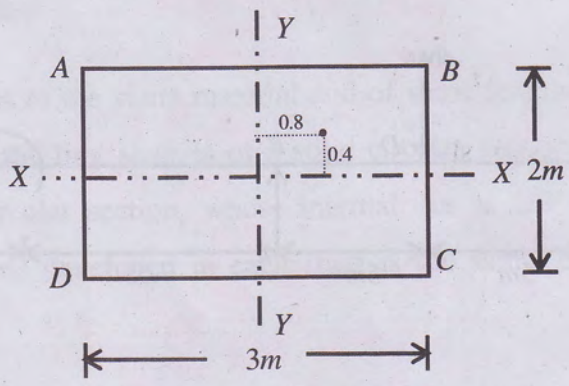
Q.2 (a) A propped cantilever is acted by a uniformly distributed moment of intensity m per unit distance along the axis of the beam. Find the Reaction at B. [8]



(b) A masonry pier of 2m x 3m supports a vertical load of 50 kN as shown in fig below. Find. [8]

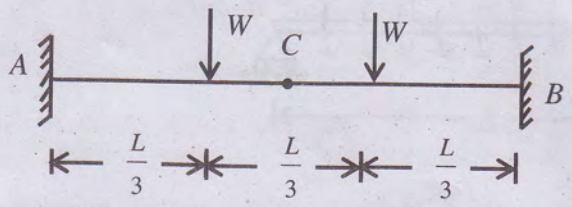
(i) Stresses developed at each corner of the pier.

(ii) What additional load should be placed at the centre of the pier, so that there is no tension any where in the pier section.



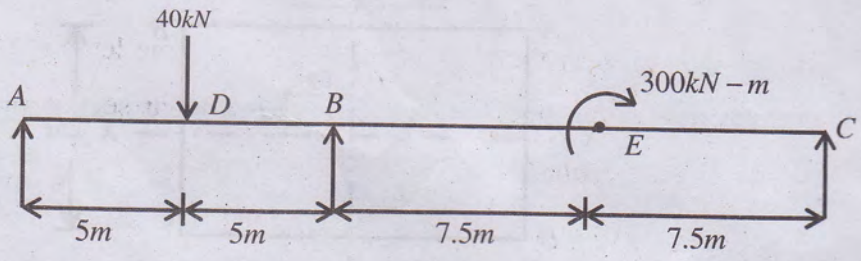
UNIT-III

Q.3 Find the support moments of a built - in beam loaded at third points by two point loads W each. Also draw the B.M and S.F diagrams and compute the deflection at the centre. [16]



OR

Q.3 A continuous beam ABC of constant moment of inertia is simply supported at A, B and C. The beam carries a central point load of 40 kN in span AB and a central clockwise couple of 300 kN-M in the Span BC, as shown in fig. below. Find the support moments and plot the shear force and bending moment diagrams. [16]



UNIT-IV

Q.4 (a) Write down the assumptions used in developing the equations for stresses and deformation in a bar subjected to pure torsion. [4]

(b) The stiffness of a close-coiled helical spring is 1.5 N/mm of compression under a maximum load of 60N. The maximum shearing stress produced in the wire of the spring is 125 $N/mm^{2.}$ The solid length of the spring (when coils are touching) is given as 5cm. Find [12]

(i) Diameter of wire

(ii) Mean diameter of the coils and

(iii) Number of coils required. Take $N = 4.5 \times 10^4$ N/mm^2 (Modulus of rigidity)

OR

Q.4 (a) Derive expressions for stiffness of composite springs when two springs of stiffness S_1 and S_2 respectively are arranged in [6]

(i) Series &

(ii) Parallel

(b) Two shafts of the same material and of same lengths are subjected to the same torque, if the first shaft is of a solid circular section and the second shaft is of hollow circular section, whose internal dia. is 2/3 of the outer dia. and max. Shear stress developed in each shaft is the same; compare the weights of the shafts. [10]

UNIT-V

Q.5 Write short notes on the following (any four) [4×4=16]

(a) Degrees of freedom.

(b) Consequences of vibration

(c) Vibration control in the design of structures.

(d) Mathematical modelling of an SDOF system

(e) D' Alembert's principle

(f) Types of vibration.

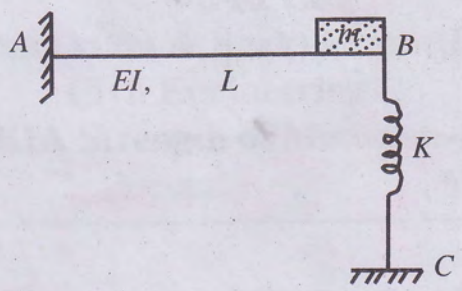
OR

Q.5 (a) A cantilever beam AB of Length L is attached to a spring K and a mass M as shown in fig. below. [10]

(i) Form the equation of motion.

(ii) Find expression for the frequency of motion

(iii) Determine static deflection of spring.



(b) Explain the Rayleigh's method to determine the natural frequency of the system. [6]

4E4112

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4E4112

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016

Civil Engineering

4CE2A Concrete Technology

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks (Main & Back): 26

Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Discuss and compare the role of C_3S, C_2S AND C_3A in governing the various properties of cement. [8]

(b) Define workability of concrete. With the help of neat dimensional set up experiment, describe "Slump test" and its limitations. [2+4+2=8]

OR

Q.1 (a) Differentiate between the followings.

(i) Elongated and flaky aggregates

(ii) Segregation and bleeding of concrete. [2×4=8]

(b) Describe C-S-H gel. Calculate minimum w/c ratio required for 60% hydration, so that cement gel just occupies the available space completely. [2+6=8]

UNIT-II

Q.2 (a) With the help of neat schematic curve, describe the creep phenomena and its recovery. Also discuss the factor affecting the creep of concrete. [8]

(b) Describe the principle and method of Rebound Hammer NDT and its limitations. [8]

OR

Q.2 (a) Describe the maturity concept of concrete and its significance. A concrete having full maturity strength of 325kg/cm^2 is used in cold zone at 5°C temperature. Using Plawman's equation estimate its strength after 15 days. Use coefficient A = 21 and B = 61. [3+5=8]

(b) List the type of shrinkage of concrete. Describe the plastic shrinkage and discuss the preventive measures to reduce the plastic shrinkage. [2+3+3=8]

UNIT-III

Q.3 (a) Differentiate between weigh batching and volume batching. With the help of schematic line diagram explain the batching through "Automatic batching plant". [4+4=8]

(b) Brief describe the following method of compaction of concrete.

(i) Rodding

(ii) Ramming

(iii) Tamping.

(iv) Compaction through surface vibrators. [2×4=8]

OR

Q.3 (a) (i) Describe the necessity and important of curing.

(ii) How does the curing temperature affect the strength of concrete?

(iii) Describe the steam curing in detail. [3+3+4=10]

(b) Describe the various steps of mixing of concrete using tilted concrete mixer. Also describe the term "buttering of mixer". [4+2=6]

UNIT-IV

Q.4 (a) Describe the accelerator admixtures, specifically on the following points:

(i) Purpose & specific situation when these are to be used.

(ii) Example of commonly used accelerators.

(iii) Their effect on strength of concrete. [4+2+2]

(b) Discuss the use of fly ash and silica fume as admixture in concrete. [8]

OR

Q.4 (a) Describe the terms "target mean strength" and "characteristics strength of concrete". Give the equation for finding quantity of coarse aggregate in mix design by I.S. method, explain each and every term involved in the equation. [3+4=7]

(b) Different between the following:

(i) Retarder and accelerator admixture.

(ii) Chemical and mineral admixture.

(iii) Plasticizers and super plasticizers. [3×3=9]

UNIT-V

Q.5 Write short note on the followings:

(a) High strength concrete

(b) Under water concreting

(c) Self compacting concrete

(d) Slip Form Work [4×4=16]

OR

Q.5 (a) Describe the requirement of a good formwork. [6]

(b) Describe the salient properties and application of sulphate resisting concrete. [5]

(c) Draw a typical neat-labeled sketch of formwork for R.C.C. beam-slab. [5]

4E4113

Roll No. _____ Total No of Pages: 4

4E4113

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016

Civil Engineering

4CE3A Hydraulics & Hydraulic Machines

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks (Main & Back): 26

Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Prove that velocity through an orifice can be expressed as [10]

$$V = \sqrt{2gH}\ \varphi\left[\frac{D}{H}, \frac{\mu}{eVH}, \frac{\sigma}{eV^2H}\right]$$

Where H is the head causing flow, D is the diameter of the orifice, μ is the coefficient of viscosity, e is the mass density and σ is the surface tension.

(b) What do you understand by Distorted Model? Give a suitable example for distortion. [6]

OR

Q.1 (a) Define the following-

(i) Froude's number [2]

(ii) Mach's number [2]

(iii) Weber's number [2]

(iv) Euler's number [2]

(b) A pipe of diameter 1.8m is required to transport an oil of specific gravity 0.8 and viscosity of 4×10^{-2} poise at the rate of 4 m^3/s. The tests were conducted on a 20 cm dia. Pipe using water at 20°C. Find the velocity and rate of flow in the model. Viscosity of water at 20°C is 1×10^{-2} poise. [8]

UNIT-II

Q.2 Derive Hagen – Poiseulli's equation for laminar flow in pipes. Also derive the relationship between

(a) Darcy's friction coefficient 'f' and Reynolds's number 'N_R'. [8]

(b) Wall shear stress and Darcy's coefficient 'f' state the assumption also. [8]

OR

Q.2 For the velocity profile given by: [16]

$$\frac{V}{V_o} = \frac{3}{2}\left(\frac{y}{\delta}\right) - \frac{1}{2}\left(\frac{y}{\delta}\right)^3$$

for the laminar boundary layer determine the expression for boundary layer thickness, wall shear stress and coefficient of drag in terms of Reynolds's number.

Explain in brief the methods of controlling boundary layer.

UNIT-III

Q.3 (a) A wide channel laid to a slope of 1 in 1000 carries a discharge of 3.5 m^3/s per meter width at a depth of 1.6m: [10]

(i) Find the value of Chezy's constant 'C' assuming the flow to be uniform.

(ii) If the depth varies gradually from 1.5 m to 1.7 m at a location 300m downstream, what will be the value of 'C'.

(b) Derive the condition of most economical trapezoidal section. [6]

OR

Q.3 (a) Explain the various types of surface curves with the help of neat sketches. [8]

(b) The discharge of water through a rectangular channel of width 8m, is 15 m^3/s when depth of flow of water is 1.2m. Determine- [8]

(i) Specific energy of the flowing water

(ii) Critical depth and critical velocity

(iii) Minimum specific energy

UNIT-IV

Q.4 (a) A jet of water having a velocity of 60 m/s impinges without shock on a series of vanes moving at 30m/s. The direction of motion of vanes is inclined at 20° to that of jet. The relative velocity at outlet is 0.9 of that at inlet and flow is radial at exit. Find out- [8]

(i) Vane angles at inlet and exit

(ii) Work done by the vanes

(iii) Hydraulic efficiency

(b) Show that the efficiency of a free jet striking normally on a series of flat plates mounted on the periphery of a wheel can never exceed 50%. [8]

OR

Q.4 (a) Derive a relationship for depth before and after the hydraulic jump in a rectangular channel state the assumption mode. [8]

(b) At the foot of a 30m wide spillway from a dam when the discharging velocity is 28.2m/s and the depth of flow is 0.96m, a hydraulic jump is formed on a horizontal apron. Calculate the height and energy dissipated in the jump. [8]

UNIT-V

Q.5 (a) A centrifugal pump operating against a manometric head of 35m has a manometric efficiency of 0.85. Radial velocity of flow is constant throughout. The increase in pressure over the impeller is 65% of the theoretical head developed by the pump. Determine:

(i) Speed

(ii) Discharge

The impeller outer diameter is 16cm and breadth is 16mm. The moving vane angle at exit is 60°. Neglect impeller losses. [10]

(b) What do you mean by cavitation in turbines? What are its effects and explain the methods of prevention of cavitation. [6]

OR

Q.5 (a) Give reasons for the following-

(i) In reaction turbines and centrifugal pumps, the relative velocity vector is tangential to the blades. [2]

(ii) Kaplan turbine has high port load efficiency. [2]

(iii) Draft tubes are provided only for reaction turbines and not impulse turbines. [2]

(iv) Centrifugal pumps have comparatively lower efficiencies than reaction turbines. [2]

(b) A Kaplan turbine develops 22000 kW at an average head of 35m. Assuming a speed ratio of 2, flow ratio of 0.6, diameter of the boss equal to 0.35 times the diameter of runner and an overall efficiency of 88%. Calculate the diameter, speed and specific speed of the turbine. [8]

4E4114

Roll No. _____ Total No of Pages: 4

4E4114

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016

Civil Engineering

4CE4A Surveying-I

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks (Main & Back): 26

Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1. NIL 2. NIL

UNIT-I

Q.1 (a) What is surveying? How it is useful for civil Engineers? [8]

(b) Distinguish between plain and geodetic surveying. [8]

OR

Q.1 (a) Briefly explain sources of errors in surveying. [6]

(b) Explain different corrections to take measurements. [10]

UNIT-II

Q.2 (a) Explain with a neat sketch working of a prismatic compass. [8]

(b) During a traverse survey ABCDA, the following interior angles were measured with a compass:- [8]

$\angle A = 75°$, $\angle B = 120°$, $\angle C = 80°$ and $\angle D = 85°$

If the bearing of the line AB is 99°. What are the bearings of the remaining lines of traverse?

OR

Q.2 (a) Differentiate between:-

(i) Line of collimation and line of sight [2]

(ii) Face left and Face right condition. [2]

(iii) Altitude level axis and plate level axis. [2]

(b) Explain the temporary adjustment of transit theodolite. [10]

UNIT-III

Q.3 (a) What is a traverse? Discuss different uses of traverse surveying. [6]

(b) Differentiate between:- [10]

(i) Open traverse and closed traverse.

(ii) Bowditch's rule and transit rule.

(iii) Latitude and departure.

OR

Q.3 The following bearings are taken on a closed traverse: [16]

Line	A B	B C	C D	D E	E A
F . B	80° 10′	120° 20′	170° 50′	230° 10′	310° 20′
B . B	259° 0′	310° 50′	350° 50′	49° 30′	130° 15′

Compute the interior angles and find correct bearings of lines if bearings of CD is correct.

UNIT-IV

Q.4 (a) Differentiate between simple levelling and differential levelling. [8]

(b) What are temporary adjustments of dumpy levels? How they are performed? [8]

OR

Q.4 The following readings were observed successfully with a levelling instrument. The instrument was shifted after 5^{th} and 11^{th} readings. [16]

(1) 0.585 (2) 1.010 (3) 1.735 (4) 3.295 (5) 3.775

(6) 0.350 (7) 1.300 (8) 1.795 (9) 2.575 (10) 3.375

(11) 3.895 (12) 1.735 (13) 0.635 (14) 1.605

Draw up a page of level book and determine the R. L. of various points, if R. L. of first point is 136.440m. Use the Rise and Fall method.

UNIT-V

Q.5 (a) What are different methods of plane table survey? Discuss intersection method with its suitability. [8]

(b) Explain the two points problem and its solution. [8]

OR

Q.5 (a) What is contour interval? Explain the factors to be considered in deciding the contour interval. [8]

(b) What are different uses of contour maps? Explain. [8]

4E4115

Roll No. _____ Total No of Pages: 3

4E4115

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016

Civil Engineering

4CE5A Building Planning

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks (Main & Back): 26

Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1. Table 9 – SP – 41 (S&T) - 1987 2. ½ size drawing sheet

UNIT-I

Q.1 (a) Write down the different criteria for selection of site for a building. Discuss economic and legal aspects. [10]

(b) Discuss types of buildings based on fire resistance. [6]

OR

Q.1 (a) Design a horizontal louver for northern India for an external wall facing south for completely cutting off summer sun and allowing winter sun. β = O (say) size of window 100 cm (H) × 200 cm (V). [8]

(b) Discuss the means of energy conservation in buildings. [8]

UNIT-II

Q.2 (a) What do you mean by orientation of a building? Discuss factors affecting it. [8]

(b) What do you understand by global climate? Discuss factors affecting global climate. [8]

OR

Q.2 (a) What do you mean by building Bye-Laws? Discuss its objectives. [6]

(b) Discuss regulations regarding: [10]

(i) Open spaces

(ii) Lines of building frontages

(iii) Size of rooms.

UNIT-III

Q.3 (a) What do you mean by planning of a building? Explain general scope of a building with examples. [8]

(b) Discuss Roominess, Circulation, Flexibility and Privacy with respect to planning of a building. [8]

OR

Q.3 (a) Discuss design of a residential building as per vastu. [8]

(b) State and discuss any four factors affecting planning of building. [8]

UNIT-IV

Q.4 Design and draw a residential building on a plot of $40' \times 70'$. There are roads on the North and East side of plot. Draw a plan and front elevation and mention schedule of rooms, doors, window and ventilators. [16]

OR

Q.4 Design and draw a primacy school of capacity 400 students. Estimate the size of plot, draw plan and front elevation and show the furniture detail of a classroom with dimension detail. [16]

UNIT-V

Q.5 (a) What do you mean by acoustics of a building? Discuss acoustical requirements of a building. [6]

(b) Discuss design of a cinema hall. [10]

OR

Q.5 (a) Discuss lighting and ventilation requirements in a building [8]

(b) Discuss fire fighting provisions in a building. [8]

4E4116

Roll No. _____ Total No of Pages: 4

4E4116

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016
Civil Engineering
4CE6A Quantity Surveying &Valuation

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks (Main & Back): 26
Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1. NIL 2. NIL

UNIT-I

Q.1 Discuss the importance of quantity survey and valuation techniques in civil construction projects. [16]

OR

Q.1 (a) What do you mean by 'Supplementary Estimates'? Explain the circumstances under which such estimates are prepared. [8]

(b) Describe various factors that influence the accuracy of estimates of building construction project. [8]

UNIT-II

Q.2 (a) Write the purposes of 'Rate Analysis'. [6]

(b) Analyze the rate of 12 mm thick 1: 4 cement and local sand mortar plaster on brick wall including material, labour T and P, watering etc. [10]

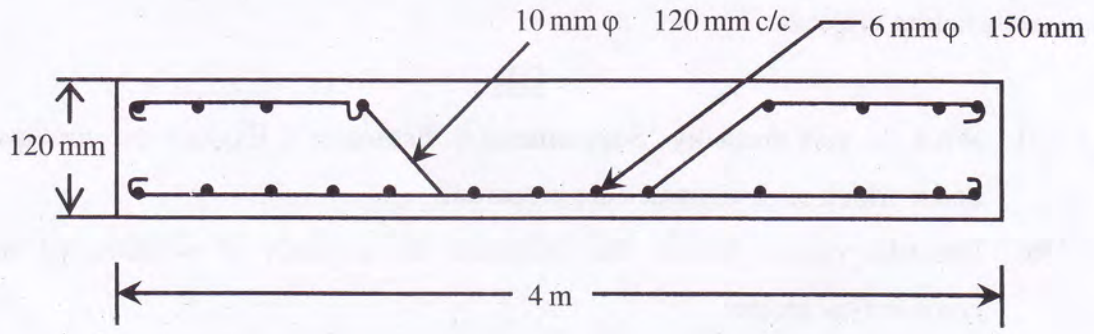
OR

Q.2 (a) Write detail note on various factors affecting the Rate Analysis. [6]

(b) Analyze the rate of following item or work (assume suitable data e.g. rates of material and labour etc.) for "First class brick work in 1:6 cement sand mortar". [10]

UNIT-III

Q.3 Prepare a details estimate of the quantities of concrete and steel of R.C.C. slab of overall dimensions 4m × 8.5m having an overall depth of 120mm. 10mm diameter main bars are spaced at 120mm centers with alternate bars bend up at 1/5 span. 6mm diameter distribution steel is provided at 150mm centers. Cross section of slab is shown in Figure. Prepare bar bending schedule. Separately. [16]



OR

Q.3 Calculate the quantity of earthwork for a portion of a road from the following data.

Formation width of road = 10m [16]

Side slope = 2 : 1

Assume there is no transverse slope

Use prismoidal formula

Distance in M	0	100	200	300	400	500	600
R.L. of ground	114.50	114.75	115.25	115.20	116.10	116.85	118
R.L. of formation	115	Upward Gradient 1 : 200					

UNIT-IV

Q.4 (a) Explain with an example the procedure for working out the cost of materials at site. [6]

(b) Differentiate between an ordinary cash book and subsidiary cash book. What certificate is required to be given at the time of closing of a cash book? [10]

OR

Q.4 Write short notes on the following: [4×4=16]

(a) Work charge establishment

(b) Travelling allowance

(c) Measurement Book

(d) Contingencies

UNIT-V

Q.5 (a) Write down the purpose of valuation. [4]

(b) Explain 6 major types of outgoings. [4]

(c) Explain year's purchase and sinking fund. [8]

OR

Q.5 (a) What do you mean by depreciation? Explain four major methods of calculating depreciation. [6]

(b) A three storey building is standing on a plot of land measuring 800 Sq.m. The plinth area of each storey is 400 Sq.m. The building is of RCC framed structure and the future life may be taken as 70 years. The building fetches a gross rent of Rs. 1500 per month. Work out the capitalized value of the property on the basis of 6% net yield. For sinking fund 3% compound interest may be assumed. Cost of land may be taken as Rs 40 per Sq.m. Other data required may be assumed suitably. [10]
