Roll No. _____

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4E 4116

4E 4116

B.Tech. IV Semester (Main/Back) Examination, May 2018
Civil Engineering
4CE6A Quantity Surveying & Valuation

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

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.*

Unit - I

1. a) Describe the approximate size of the following items/works

   i) Height of a common room

   ii) Shallow foundation

   iii) Plinth height

   iv) Steps, Rise/Treads   (4×2=8)

   b) Write down units of measurements for the following works

   i) Dismantling of electric wiring

   ii) Skirting 4" Wide

   iii) Damp proof course 2" Thick

   iv) Roofing with G.I sheet

   v) Ornamental pillar caps

   vi) Plastering on walls

   vii) Thin partition wall

   viii) Fixing of Fans in a hall   (8×1=8)

OR

1. Write short notes on the following :

   i) Bill of quantities

   ii) Schedule of Rates

4E4116 /2018   (1)   [Contd....

iii) Revised Estimate

iv) Plinth area Estimate   (4×4=16)
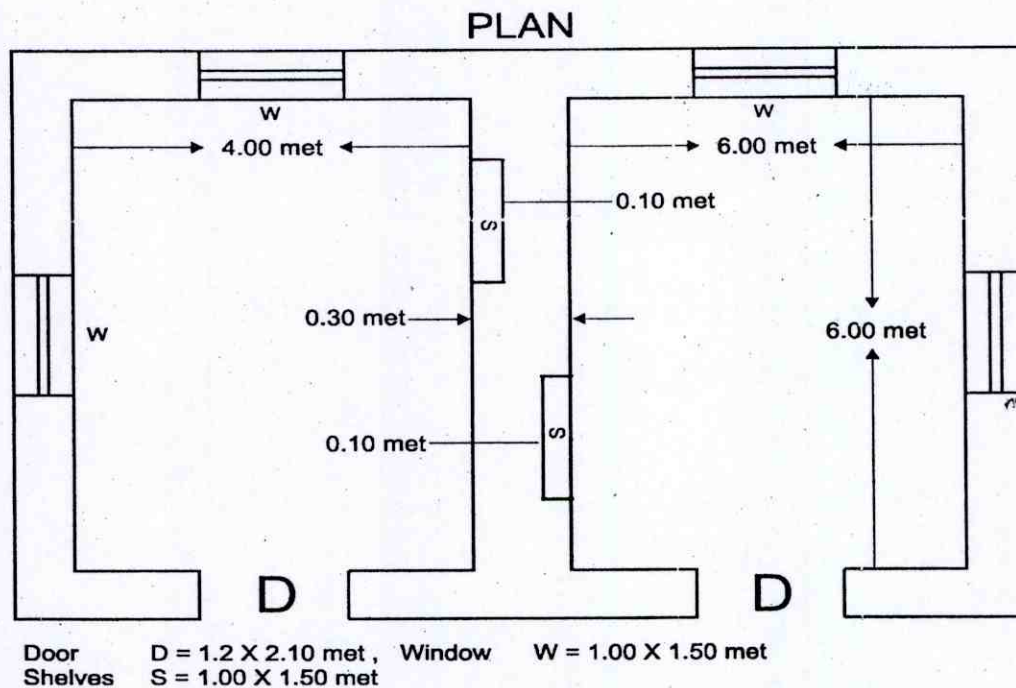
Unit - II

2. a) Describe the purpose of Rate analysis   (4)

    b) Analysis the rates of M - 15 grade reinforced cement concrete for slab on 1st floor (Assume suitable data for labour & material rates)   (12)

OR

2. a) Discuss various factors affecting the Rate analysis.   (4)

    b) Calculate the material & labour (Analysis of rate) to construct a Random Rubble Stone masonary Boundary Wall (in super structure) for 10 cub met. (Assume suitable data)   (12)
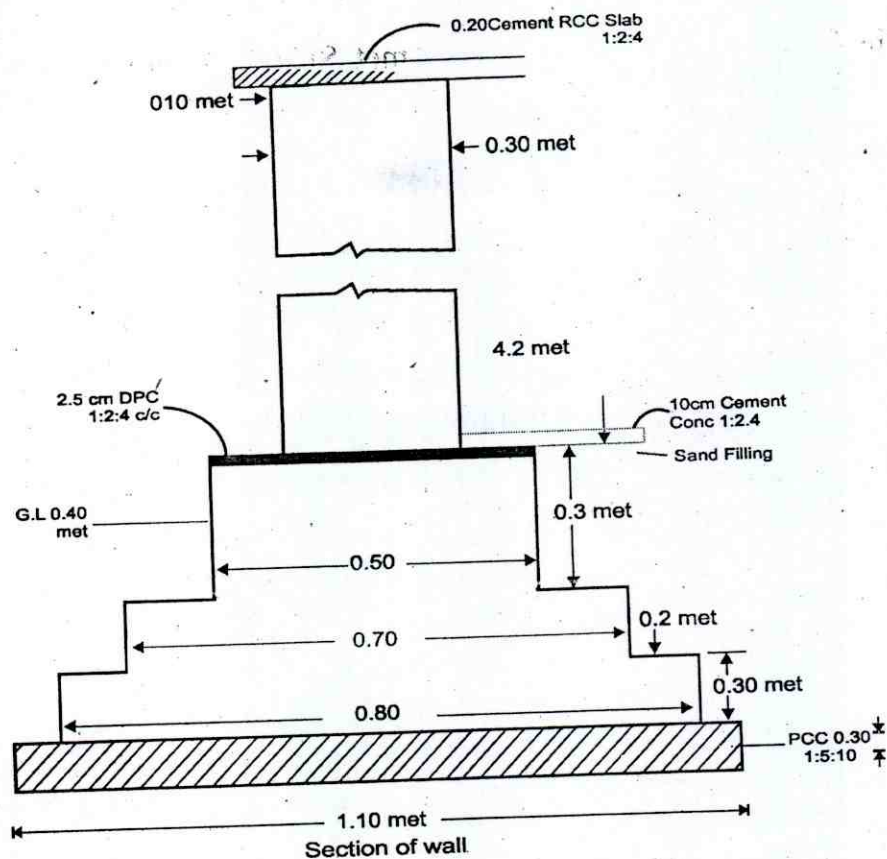
Unit - III

3. From the given figure below, prepare the detail & abstract estimate for two room building (For load Bearing structure) by long wall. Short wall method.

PLAN

Door   D = 1.2 X 2.10 met ,   Window   W = 1.00 X 1.50 met
Shelves   S = 1.00 X 1.50 met

(16)

Door D = 1.2×2.10 met, Windows W = 1.00 × 1.50 met, Shelves S = 1.00 × 1.50 met.

0.20Cement RCC Slab
1:2:4

010 met →

← 0.30 met

4.2 met

2.5 cm DPC
1:2:4 c/c

10cm Cement
Conc 1:2.4

Sand Filling

G.L 0.40
met

0.3 met

0.50

0.2 met

0.70

0.30 met

0.80

PCC 0.30
1:5:10

1.10 met

Section of wall

OR

3. Prepare a detailed estimate for the earth work for a portron of a road from the following data : **(16)**

Chainage	R.L of Ground	R. L of formation	Gradient
0	114.50		
100 m	114.75		Upward gradient (1 in 200) up to 600 met
200 m	114.25		
300 met	115.20		
400 met	116.10	115.0	
500 met	116.85		
600 met	118.00		Downword gradient (1 in 400)
700 met	118.25		
800 met	118.10		
900 met	117.80		
1000 met	117.75		
1100 met	117.90		
1200 met	117.50		

The formation width the road is 10 met. Side sloper are 2 : 1 in Banking & $1\frac{1}{2}$:1 in cutting.

Draw longitudinal section of the road & a typical cross section and prepare an estimate of the earth work for the road at the rate of Rs. 485 per cubic meter in Banking & Rs. 385 per cubic meter in cutting.

Unit - IV

4. a) Describe work charge establishment in detail.   **(4)**

    b) Write short notes on the following :
        i)   Measurement Book
        ii)   Travelling allowance
        iii) Liquidated damages
        iv)   Imprest Account   **(3×4)**

OR

4. a) Discuss various factors affecting the cost of work.   **(5)**

    b) Give the percentage break up in building for following
        i)   Cost of different parts break up of building (excluding sanitary & electrical work)   **(5)**
        ii)   Cost of sanitary & electrical works   **(2)**
        iii) Cost of material & labour required for building percentage distribution. **(4)**

Unit - V

5. a) Write short notes on
        i)   Outgoing
        ii)   Salvage value
        iii) Obsolescence   **(4×3)**

    b) What is sinking fund & why it is provided?   **(4)**

OR

5. A city corporation has to acquire an area of 35,0000 sq met for the development of a new colony. After developing the area it is proposed to be sold at Rs. 45,000 per sq.met. Work out the maximum compensation which can be given to the owners, whose land is to be acquired for the development of the colony assuming

    a) The corporation establishment charges = 15% on sale price.

    b) 40% area is to be provided for roads, parks and other public emenities.

    c) Colony improvements expenditure = Rs 130 per sq. met.

    d) Engineer's and Architect's fee for surveying and planning the colony = 4% on the sale plots.   **(16)**

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4E4115

4E4115

B.Tech. IV Semester (Main/Back) Examination, May 2018
Civil Engineering
4CE5A Building Planning

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

*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 suitable 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 g-s.p.-41 (SR T)-1987   2. $^1/_2$ Size drawing sheet

UNIT - I

1. a) What is Building? Discuss the different types of buildings in short.   (8)

    b) What is the site plan? Discuss various factors which affecting the selection of site.   (8)

OR

1. a) What is sunchart? Discuss any one method of drawing sunchart.   (8)

    b) What is meant by sun shading devices? State and discuss any one type of sun shading devices.   (8)

UNIT - II

2. a) What do you understand by climate? Discuss various climatic zones of India.(8)

    b) What do you mean by orientation of a building? Discuss various factors affecting orientation of building.   (8)

OR

2. a) What do you understand by building byelaws? Discuss regulations regarding: (8)

    i) Open spaces

    ii) Height and size of rooms.

[Contd....

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    ii)   Height and size of rooms.

b)   Explain the building byelaws with reference to   **(8)**

    i)   Floor area ratio

    ii)   Sanitation provisions

    iii)   Kitchen

UNIT - III

3.   a)   Explain the term principles of planning. Discuss various factors affecting planning.   **(8)**

    b)   Explain the signification of Roominess and circulation in planning of a residential building.   **(8)**

OR

3.   a)   State the direction and factors considered in "vaastushastra" and its importance in Buildings.   **(8)**

    b)   Discuss various design criteria for residential building as per vaastu.   **(8)**

UNIT -IV

4.   Design and draw the plan and elevation of a residential building on a plot of size 12m×22m. Road is on the North side of the plot.   **(16)**

OR

4.   Design and draw a plan of primary health centre for a population of 10,000 with following facility.   **(16)**

    i)   Entrance and waiting space

    ii)   Registration cum enquiry centre

    iii)   Jrs consultation room No.5

    iv)   General wards 20 beds

    v)   Dressing Injection room

    vi)   Dispensary cum Drug storage

    vii)   Parking space and sanitary Unit.

Unit -V

5. a) What do you mean by light comfort and ventilation comfort? Discuss the functional requirement of ventilation. (8)

   b) Discuss the acoustics and sound insulation of a building. (8)

OR

5. a) State different types of doors and windows. Differentiate between Bay window and dormer window with sketches. (8)

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

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4E4114

B.Tech. IV semester (Main & Back) Examination, May - 2018
Civil Engineering
4CE4A Surveying - I

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

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.*

Unit - I

1. Discuss in brief the principles of surveying. Differentiate clearly between plane & geodetic surveying. Also highlight the uses of surveying. **(16)**

OR

1. a) Explain the method of testing & adjusting a chain. **(6)**

   b) The distance between two stations, measured with a 20 m chain, was found to be 995 m. The same distance was found to be 996 m, when a 30 m chain was used. If the 20 m chain was 0.10 m short, what was the error in the 30 m chain? **(10)**

Unit - II

2. The following fore bearings & back bearings were observed in traversing with a compass.

Line	Fore bearing	Backbearing
PQ	$S37°30'E$	$N37°30'W$
QR	$S43°15'W$	$N44°15'E$
RS	$N73°00'W$	$S72°15'E$
ST	$N12°45'E$	$S13°15'W$
TP	$N60°00'E$	$S59°00'W$

   Calculate the interior angles and correct them for observational errors. **(16)**

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(1)

[Contd....

OR

2. a) Describe the process of permanent adjustment of a transit theodolite. **(8)**

   b) Draw a neat sketch of transit theodolite show the various parts and describe their function briefly. **(8)**

Unit - III

3. Write detail note on different methods of traversing. **(16)**

OR

3. Write Detail note on methods of computations and adjustment of traverse. **(16)**

Unit - IV

4. Write short note on :

   a) Diaphragm.

   b) Benchmark

   c) Focussing

   d) Principle of levelling. **(4×4=16)**

OR

4. a) A light house is visible just above the horizon at a certain station at the sea level. The distance between the station & the light - house is 50 km. Find the height of the light house. **(10)**

   b) Describe the various components of a plane table used for survey purposes. What are their functions? **(6)**

Unit - V

5. a) Define the term 'contourline', 'contour interval' and 'horizontal equivalent'. **(8)**

   b) What are the characteristics of contour lines? **(8)**

OR

5. a) What is a contour gradient? Describe the methods for plotting contour gradient on plan. **(8)**

   b) Describe the methods of interpolation of contours. **(8)**

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4E4113

B.Tech. IV semester (Main & Back) Examination May - 2018
Civil Engineering
4CE3A Hydraulics and Hydraulic Machines

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

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.*

Unit - I

1. a) What do you understand by distorted models? What is the necessity of distorted models? Explain the disadvantages of distorted models. **(8)**

   b) Show that the power (P) developed in a water turbine can be expressed as :

   $$P = \rho N^3 D^5 \phi \left[\frac{D}{B}, \rho \frac{D^2 N}{\mu}, \frac{ND}{\sqrt{gH}} \right]$$

   Where D and B are the diameters and width of the runner, N is the speed in r.p.m., H is net head, ρ and μ are coefficient of mass density and dynamic viscosity of liquid respectively. **(8)**

OR

1. a) State Buckingham's π - theorem. What are the advantages of Buckingham's π - theorem over Rayleigh's method of dimensional analysis? **(8)**

   b) A river model has a horizontal scale of $\frac{1}{1000}$ and vertical scale of $\frac{1}{100}$.

   i) What Q_m corresponding to Q_p = 4000 m³/sec in the river is expected?

   ii) If the time of travel of flood peak through 100 m in the model is 1 hour, how much time would the flood peak take to travel the corresponding distance in the river.

   iii) If the Manning's 'n' for the river material is 0.03. Calculate the 'n' required for the model material. **(8)**

Unit - II

2. a) A pipe of 15 cm diameter carries water ($v = 1.1 \times 10^{-6}$ m²/sec). If the sand grains of 15 mm diameter are cemented at the inner surface of the pipe. Calculate the mean velocity at which the surface roughness just begins to disturb the laminar sub - layer. Also calculate the mean velocity at which the pipe would behave as rough pipe. (8)

   b) Explain in brief Nikurade's experiment in rough pipes. Also explain the terms: laminar sub - layer, smooth and rough boundaries flow in pipes. (8)

OR

2. a) What do you understand by hydro - dynamically smooth and rough pipe? Prove the Ka'rma'n Prandtl's equation for the velocity distribution in hydro - dynamically smooth pipes. (8)

   b) Explain the variation of friction factor in pipes. Write the various equations and plot Moody's diagram. (8)

Unit - III

3. a) Distinguish between the following :

   i) Uniform and varied flow

   ii) Mild slope and steep slope

   iii) Alternate depths and conjugate depths.

   iv) Prismatic and non prismatic channel (8)

   b) Draw the surface profile curves for mild slope and steep slope with the help of neat sketches. Also give practical examples. (8)

OR

3. a) A rectangular channel 5 m wide carries 15m³/ sec discharge at a depth of 1.5 m. Find the critical depth and th Specific energy. What is the depth alternate to 1.5 m. (8)

   b) State and explain the geometric properties of Rectangular, Triangular, Trapezoidal and Circular channels with suitable examples. (8)

Unit - IV

4. a) Explain the working of Parshall Flume with a neat sketch and also explain the use of Parshall flume. (8)

   b) A discharge of 30 m³/s flows in a trapezoidal channel having a bottom width of 5 m and side slopes 1:1. Determine.

   i) The depth after the jump when the initial depth is 0.6 m,

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(2)

ii) The height of the jump

iii) The specific energies before and after the jump. (8)

OR

4. a) An inward flow reaction turbine discharges radially and velocity of flow is constant and equal to velocity of discharge at exit. Draw the velocity triangles and derive the expression for efficiency. (8)

b) A 25 mm dia jet exerts a force of 1 kN in the direction of flow against a flat plate, which is held inclined at an angle of 30° with the axis of the stream. Find the rate of flow. (8)

Unit - V

5. a) Draw a neat sketch of governing mechanism of Pelton wheel. Explain the mechanism in detail. (8)

b) A centrifugal pump lifts water at a static head of 36 m of which 4 m is suction head. Suction and delivery pipes are both 150 mm diameter and cause head loss of 1.5 m and 7.0 m in suction and delivery pipes respectively. Other data are: impeller diameter at outlet = 0.38 m, width at outlet = 25 mm, N = 1200 rpm, and exit blade angle = 38°. Take manometric efficiency = 0.80. Determine the discharge and pressure at suction and delivery sides of pump. (8)

OR

5. a) Describe the working of a Francis turbine with the help of a neat sketch and explain its working. (8)

b) What is draft tube? Explain with the neat sketch conical draft tube and elbow draft tubs, write down the formula to calculate the efficiency of a draft tube.(8)

_____

c) What is the principle of half cell potential meter. (4)

Unit - III

3. a) Describe various methods and their suitability for curing of concrete. (8)

   b) Describe various types of concrete mix and their suitability. (8)

OR

3. a) Differentiate between the following

   i) Weigh batching and volume batching

   ii) Tamping and Rodding method of compaction. (8)

   b) Discuss briefly

   i) Method of compaction

   ii) Importance of curing for concrete (8)

Unit - IV

4. a) Explain the types and uses of water reducing and super plasticising admixtures for concrete. (8)

   b) Write short notes on (Any two)

   i) Flyash and their effect in concrete

   ii) Use of silica fume in concrete.

   iii) Air entraining agents (2×4=8)

OR

4. a) Discuss the role of accelerators. Why chloride free accelerators are to be preferred. (6)

   b) Explain the role of retarders. (6)

   c) Discuss the advantages of using silica fume in concrete. (4)

Unit - V

5. a) Discuss self compacting concrete, its salient properties and applications. (8)

   b) Discuss slip form work and its application areas. (8)

OR

   a) What do you understand by high performance concrete? (4)

   b) Draw the neat labelled sketch of formwork for 'beam -slab' construction. (6)

   c) Describe the salient properties of sulphate resisting concrete. (6)

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B.Tech. IV semester (Main & Back) Examination May - 2018
Civil Engineering
4CE2A Concrete Technology

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

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. *IS 10262*

Unit - I

1. a) Discuss gel - space ratio. **(2)**

   b) Write basic compounds of cement with their approximate oxide composition limits and discuss the Heat of Hydration. **(6)**

   c) Explain methods for determination of moisture content of aggregate. **(8)**

OR

1. a) Discuss the role of water - cement ratio. **(4)**

   b) Discuss the significance of calcium silicate Hydrates. **(4)**

   c) Describe methods of determination (with help of sketch) of work ability. **(8)**

Unit - II

2. a) What is meant by creep of concrete? Discuss factors affecting it. **(8)**

   b) Explain characteristics of aggregate cement inter face. **(4)**

   c) Explain the application of rebound hammer. **(4)**

OR

2. a) What is meant by shrinkage of concrete? Discuss factor affecting it. **(6)**

   b) Explain application and use of ultrasonic pulse velocity meter with help of figuoe. **(6)**

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4E4111

4E4111

B.Tech. IV Semester (Main/Back) Examination, May - 2018
Civil Engineering
4CE1A Strength of Materials - II

Time : 3 Hours   **Maximum Marks : 80**
Min. Passing Marks : 26

*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 suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) Derive a Relation between slope, deflection and Radius of curvature.   **(6)**

   b) A beam ABC of length 8m has one support of the left end and the other support at a distance of 7m from the left end. The beam carries a point load of 16 km at right end and also carries a uniformly distributed load of 4 kN/m over a length of 3m as shown in Fig.1. Determine the slope and deflection at point C. Find also the maximum deflection between the supports.

   Take $E = 2 \times 10^5 \, N/mm^2$ and $I = 5 \times 10^8 \, mm^4$

Fig -1   **(10)**
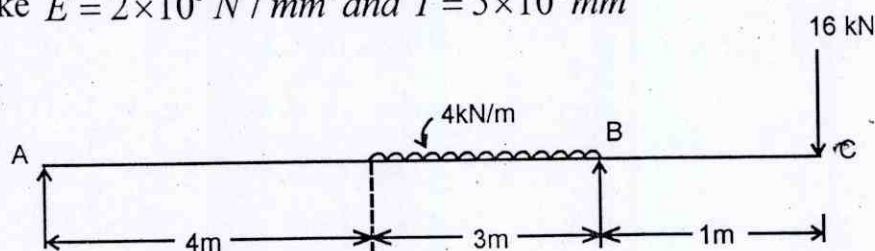
OR

1. a) A cantilever beam AB of length 4m is subjected to a concentrated load 20kN and a couple 4 kN-m acting at the free end, as shown in Fig.2. Determine the slope and deflection at the free end using by Area moment. Method.

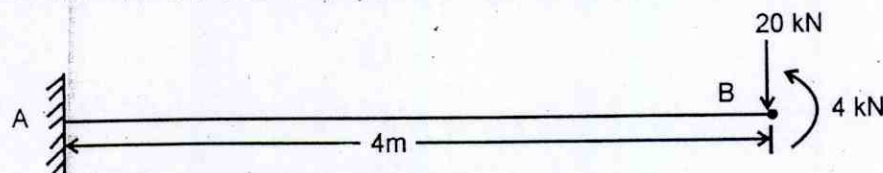   Take - $E = 2 \times 10^5 \, N/mm^2$, $I = 2 \times 10^8 \, mm^4$

Fig - 2   **(8)**

b) A simply supported beam AB of span 6m carries a point of 180 kN at its centre C. The value of I for the left half is 10^8 mm^4 and for the right half portion I is 4×10^8 mm^4. Find the slopes at the two supports and deflection under the load.

Take E $= 2 \times 10^5 \, N / mm^2$ **(8)**

Unit - II

2. A propped cantilever beam AB is fixed at A an rigidly propped at B and is loaded as shown in Fig.3. Find the reaction at A & B and also find the maximum bending moment on the span. and draw S.F.D & B.M.D
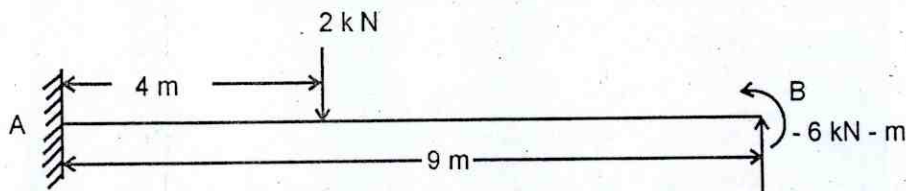
Fig - 3

(16)

OR

2. a) What is the difference between a dam and a retaining wall? And describe the types of Retaining wall. **(6)**

   b) A short column has a square section 300 mm X-300 mm with a square hole of 150 mm×150 mm as shown in Fig-4. It carries an eccentric load of 1800kN, located as shown in the figure. Determine the maximum compressive and tensile stress across the section
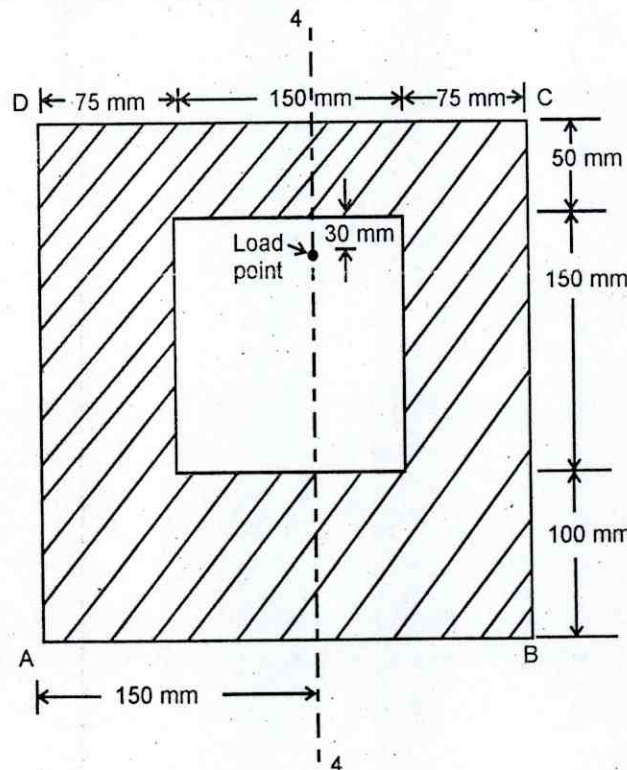

Fig - 4

(10)

Unit - III

3. a) Find the fixing moments and support reactions of a fixed beam AB of length 16m, carrying a uniformly distributed load of 2kN/m over the left half of the span. (12)

    b) What are advantages and disadvantages of a fixed beam over a simply supported beam? (4)

OR

3. A continuous beam ABC of uniform section with span AB is 8m and BC, 6m, is fixed at A and simply supported at B and C as shown in Fig-5. Find the support moments and the reactions. Also draw the S.F.D. and B.M.D. EI is constant.
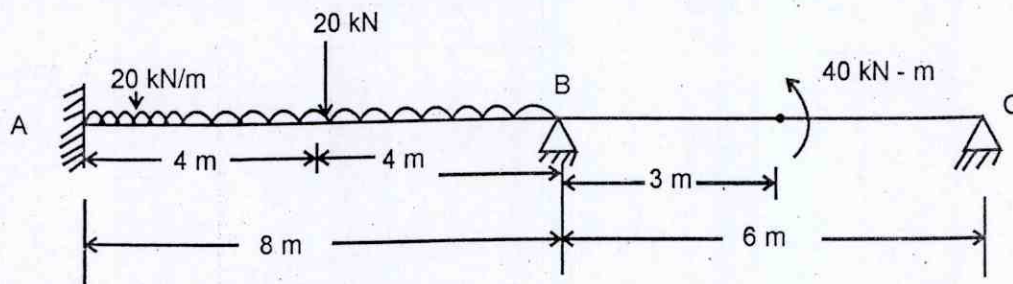

Fig - 5 (16)

Unit - IV

4. a) A hollow shaft is to transmit 300 KW power at 90 r.p.m If the shear stress is not to exceed 80 N/mm² and the internal diameter is 0.6 of the external diameter. Find the external and Internal diameters assuming that the maximum torque is 1.4 times the mean. (8)

    b) Derive expression for the axial movement of open coiled helical spring under axial Force W. (8)

OR

4. a) 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 120 N/mm². The solid length of the spring is given as 6cm. Find a) diameter of wire b) mean diameter of the coils and c) number of coils required. Take C = 4.5×10⁴ N/mm². (10)

    b) A laminated spring 2m long is made up of plates each 8cm wide and 1.5 cm thick. If the bending stress in the plate is limited to 100 N/mm². How many plates would be required to enable the spring to carry a central point load of 4 KN? If F = 2×10⁵ N/mm² and what is the deflection under the load? (6)

Unit - V

5. a) Describe the D'Almbert's Principle and it's Applications. **(6)**

   b) A mass of 6 kg is supported by a steel wire 1.2m in dia. and 3 m long. The system is made to move upwards with a uniform velocity of 18 cm/sec. When the upper end is suddenly stopped. Determine the frequency and the amplitude of the resulting vibrations of the mass and the maximum stress on the wire. **(10)**

OR

5. Write short Notes on (**Only Four**) :
   a) Angular oscillation
   b) Natural frequency
   c) Force & Free vibration
   d) Logarithmic Decrement
   e) Damped and undamped force **(16)**