III-SEM./CIVIL ENGINEERING/2021(W)

TH-I Structural Mechanics

Full Marks: 80 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. Define perpendicular axis theorem.

b. Define poisson's ratio.

c. State Hooke's law.

d. Write down the value of maximum B.M in case of a simple supported beam of length l carrying a point load of W at its center.

e. Draw the shear stress distribution diagram for a rectangular section and I section.

f. Define section modulus.

g. Define modulus of rigidity modulus.

h. What is point of contraflexure.

i. Write down the relation between elastic modulus and bulk modulus.

j. Differentiate between statically determinate and statically indeterminate structure.

2. Answer **Any Six** Questions 5X6

a. Draw the neat sketch of stress strain diagram for mild steel and explain the salient points.

b. The modulus of rigidity of a material is 0.8×10^5 N/mm^2.When a 6mmx6mm rod of this material was subjected to an axial pull of 3600N it was found that the lateral dimension of the rod changed to 5.9991 x 5.9991mm. Find the Poisson's ratio and the modulus of elasticity.

c. A brass bar having cross-sectional area of 1000mm^2 is subjected to an axial force as shown in figure. Find the change in length of the bar. Take E= 1.05×10^5 N/mm^2.

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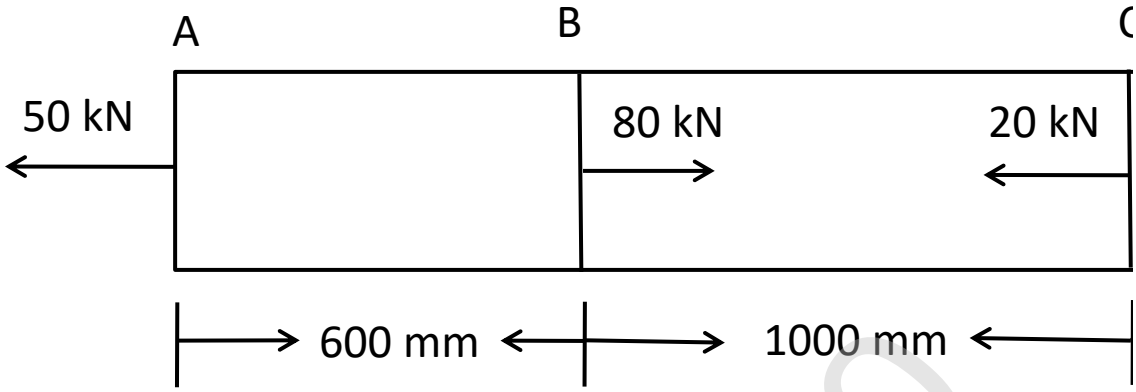

d. Draw the shear force and bending moment diagram of a cantilever beam of length 'l' carrying a concentrated load W at the free end.

e. Write down the assumptions in pure bending.

f. A timber beam 100mm wide 150mmdeep supports a uniformly distributed load over a span of 2meters.If the safe stresses are 28N/mm^2 in bending and 2N/mm^2 in shear, calculate the maximum load which can be supported by the beam.

g. A steel rod is 5m long & 50mm diameter is used as a column with one end fixed & other end free. Determine the crippling load by Euler's formula. Take E as 200Gpa.

3. A beam AB 10 meters long has supports at its ends A and B. It carries a point load of 5 KN at 3 meters from A and a point load of 5 KN at 7meters from A and a uniformly distributed load of 1KN per meter between the point loads. Draw SF and BM diagrams for the beam. 10

4. Find the moment of inertia of a T- section with flange as 150mm x150mm and web as 150mm x50mm about x-x and y-y axis through the centre of gravity of the section. 10

5. Derive the formula for slope and deflection for a simply supported beam AB of span l carrying a uniformly distributed load of w per unit run over the whole span. Also find the maximum deflection and slope at A. 10

6. a) Define principal stress and principal plane. 10
b) A beam of rectangular cross section is 300mm wide and 500mm deep. If the section is subjected to a maximum shear force of 50 KN, Find the maximum shear stress and draw the shear stress distribution along the depth of the beam.

7. a) Write down the assumptions in pure torsion. 10
b) A solid shaft of 200mm diameter has the same cross sectional area as that of a hollow shaft of the same material with the inside diameter 150mm. Find the ratio of power transmitted by the two shafts at the same speed.

III-SEM./CIVIL ENGG./ 2021(W)

TH-II Geo Tech. Engg

Full Marks: 80 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 is block diagram? What is its use?
   b. What is Density Index?
   c. Define Uniformity Coefficient.
   d. State Darcy's Law.
   e. Differentiate between compaction and consolidation of soil.
   f. State Mohr- Coulomb's equation of shear failure.
   g. Differentiate between active and passive earth pressure.
   h. Define MDD and OMC.
   i. What is Zero air void line?
   j. What is bearing capacity of soil?

2. Answer **Any Six** Questions 6 x 5
   a. Explain the origin and formation of Soil.
   b. Derive the relation between Void ratio and porosity.
   c. What is Consistency of Soil? Explain different types of Atterberg indices.
   d. Discuss about Plasticity Chart.
   e. Write short note on Quick sand condition.
   f. Compute the active and passive earth pressure force at a depth of 8m in a dry cohesionless sand with angle of internal friction 30 degree and unit weight 18 KN/m^3.
   g How many cubic meter of earth fill can be constructed at a void ratio of 0.67 from 190000 m^3 of borrow material that has a void ratio of 1.1?

3 What do you mean by sedimentation analysis? Give a brief description about pipette method. 10

4 In a consolidation test void ratio decreased from 0.70 to 0.65 when the load was changed from 50 KN/m^2 to 100 KN/m^2. Compute compression index and coefficient of volume change. 10

5 The mass and volume of a saturated clay specimen were 29.8 gm and 17.7 cm^3 respectively. On oven drying the mass got reduced to 19 gm and volume to 8.9 cm^3. Calculate shrinkage limit, shrinkage ratio and volumetric shrinkage. Also compute G of soil. 10

6 A cylindrical mould of diameter 7.5 cm contains 15 cm long sample of sand. When water flows through the soil under constant head at a rate of 55 cc/minute, the loss of head between two point 8 cm apart is found to be 12.5 cm. Determine the coefficient of permeability of soil. 10

7 What are the types of shear failures? Describe with neat sketches. 10

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3rd Sem./ Civil/ 2021(W)

TH 4 Estimation & Cost Evaluation-I

Full Marks: 80 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. State the actual and nominal size of a standard modular bricks .

b Mention the multiplying factor for painting work in case of fully glazed window and flush door.

c. What do you mean by out turn?

d When centre line method of estimating is preferred?

e Calculate the amount of plastering required for a 5mX 4m room having 30 cm thickness and 3m height?

f. Define Lead and Lift.

g Calculate the additional length of bent up bar for 45* cranked bar?

h Write down the units of the following items
i. Honey comb brick work
ii. Collapsible gate
iii.Stone Masonary
iv.Flooring

i. Classify labourers according to OPWD.

j. What is the standard weight of 20mm dia. Bar of 1m length?

2 Answer **Any Six** Questions 5x6

a. Calculate the quantity of dry material for $10m^3$ of cement concrete with proportion 1:3:6 ?

b Draw the hierarchy of Engineering department in State Govt.

c. Calculate the quantities of dry material required for 100sqm ,12mm thick plastering with proportion 1:6 ?

d Mention the duties and responsibilities of Assistant Engineer.

e. Calculate Sal wood work in chowkhat for door and window size of 1.2mX2.1m and 1mX1.5 m? Size of chowkhat 10cmX 8cm .Assume any suitable data.

f. Estimate the following items from Fig No 1 by centre line Method. 2 ½ +
i.Earth work in Excavation
ii.Brick work in foundation and plinth 2½

g Calculate the dry materials required for $450m^2$ of 25mm thick DPC in cement concrete of Proportion (1:1.5:3)?

3 Calculate the following items of work from Fig No 2. 5+5
i.Earthwork in excavation in foundation.
ii. Earth work in filling in plinth..

4 Calculate the cost of 10cum of brickwork in foundation and plinth with 20×10×10cm brick with cement sand mortar 1:6 ?

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5	Estimate the quantities of the following items of a residential building from fig-3 i. First class brick work in foundation and plinth. ii. 2.5 cm Damp proof course.		6+4
6	Estimate the quantities of the following items of a building from fig-4 iii. 12 mm thick inside plastering in walls (1:6) iv. Painting doors and windows		6+4
7	Write short notes on : (a) Plinth area Estimate (b) Contigency (c)Work charged establishment. (d) Scrap value and Salvage Value	[5X2]	2 ½ x 4

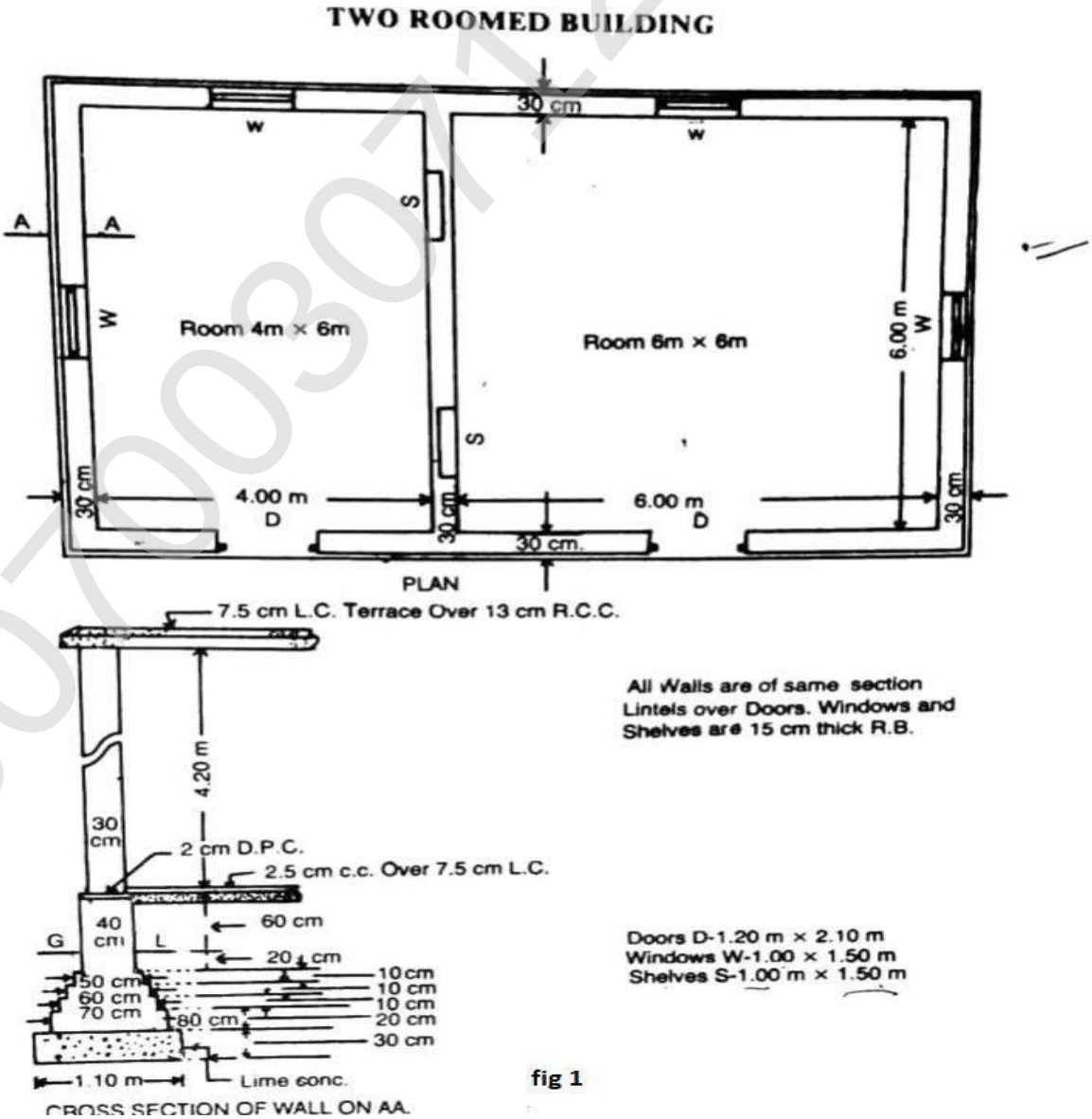

fig 1

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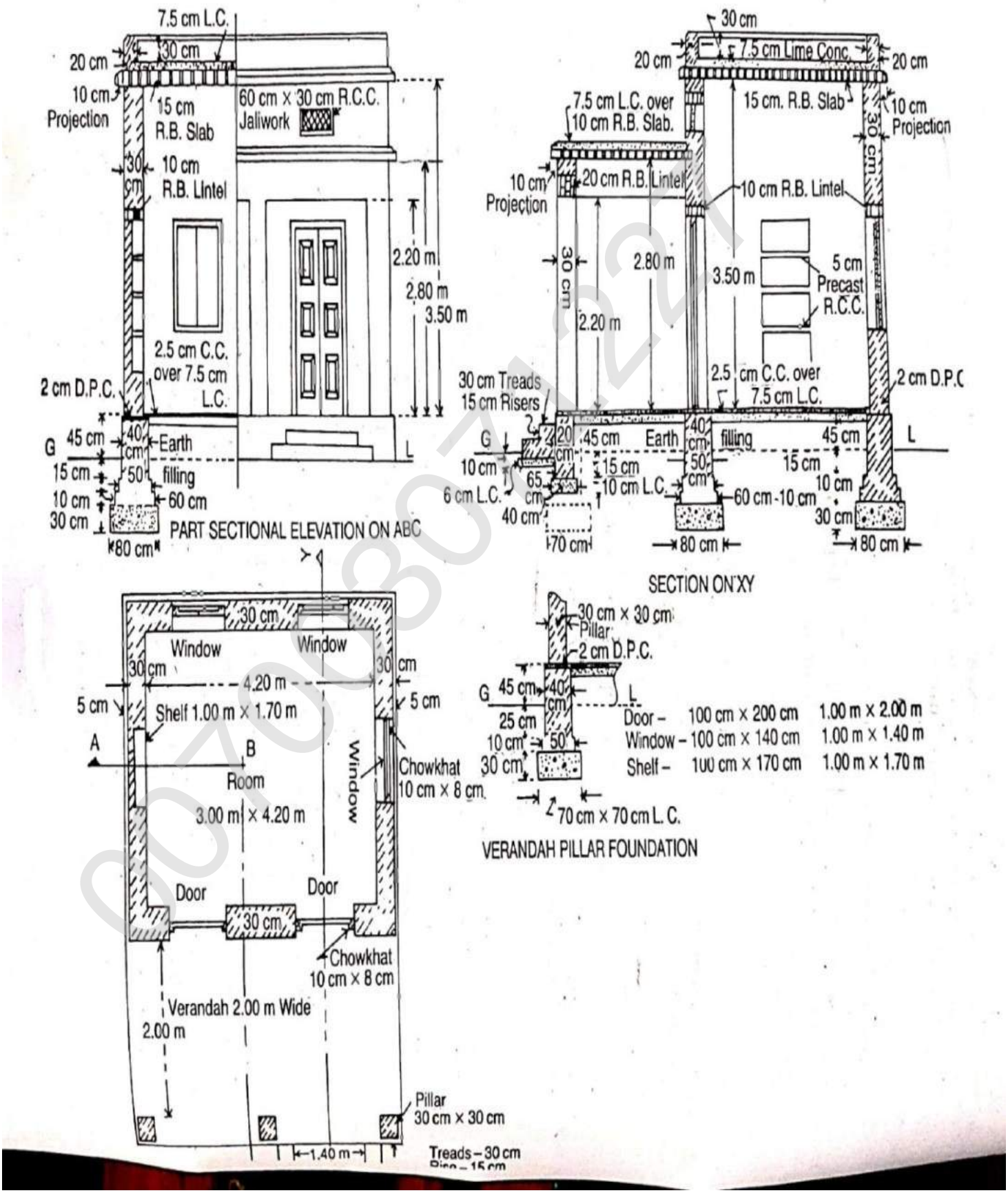
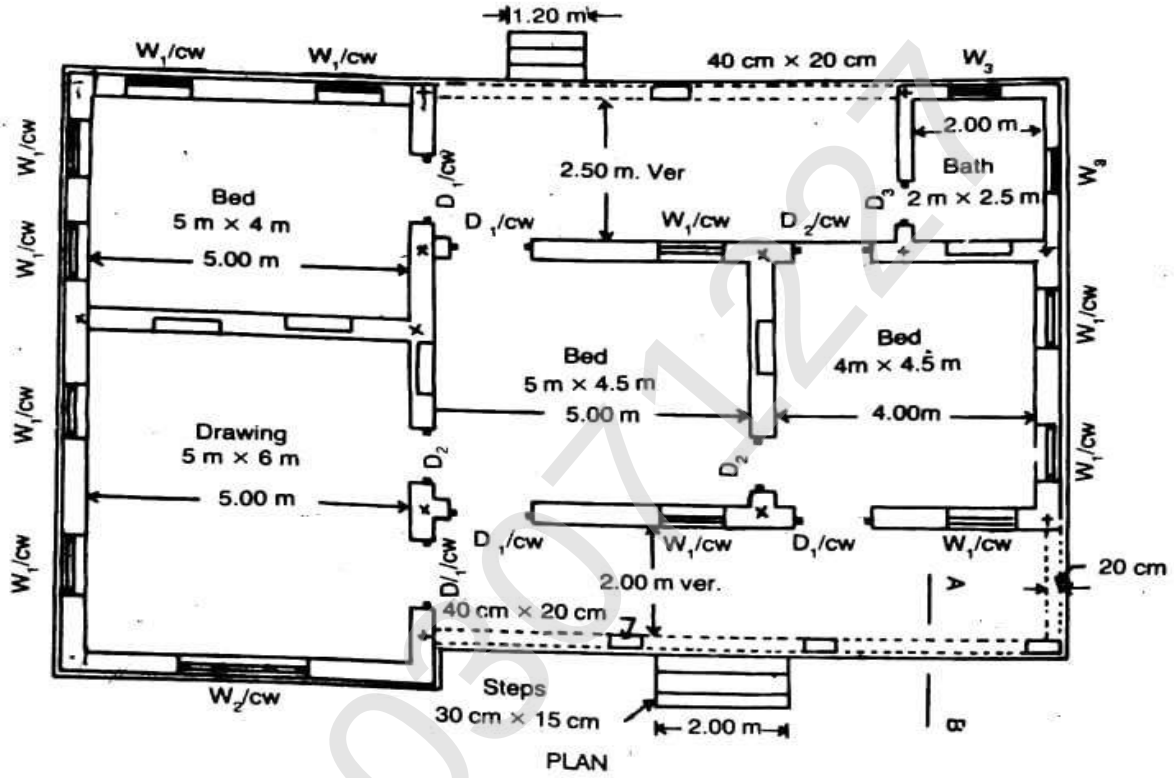
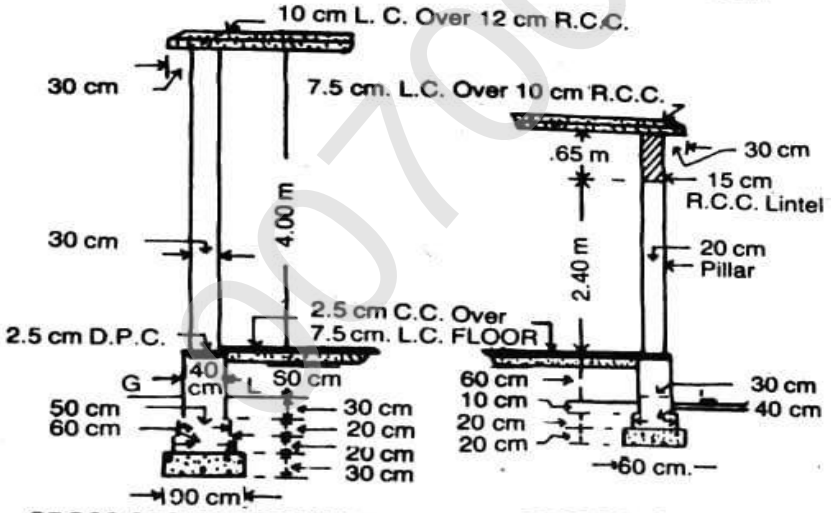

7.5 cm L.C.
30 cm
20 cm
10 cm Projection
15 cm R.B. Slab
60 cm x 30 cm R.C.C. Jaliwork
30 cm
10 cm R.B. Lintel
2.20 m
2.80 m
3.50 m
2.5 cm C.C. over 7.5 cm L.C.
2 cm D.P.C.
G
45 cm
40 cm
Earth
15 cm
50 cm
filling
10 cm
60 cm
30 cm
80 cm
PART SECTIONAL ELEVATION ON ABC
30 cm
7.5 cm Lime Conc.
20 cm
7.5 cm L.C. over 10 cm R.B. Slab.
15 cm. R.B. Slab
10 cm Projection
10 cm R.B. Lintel
20 cm R.B. Lintel
2.80 m
3.50 m
5 cm Precast R.C.C.
2.20 m
2.5 cm C.C. over 7.5 cm L.C.
2 cm D.P.C
30 cm Treads
15 cm Risers
20 cm
45 cm
Earth
filling
10 cm
65 cm
15 cm
10 cm L.C.
6 cm L.C.
40 cm
70 cm
80 cm
SECTION ON XY
30 cm x 30 cm Pillar
2 cm D.P.C.
25 cm
50 cm
Door – 100 cm x 200 cm 1.00 m x 2.00 m
Window – 100 cm x 140 cm 1.00 m x 1.40 m
Shelf – 100 cm x 170 cm 1.00 m x 1.70 m
70 cm x 70 cm L. C.
VERANDAH PILLAR FOUNDATION
Window
4.20 m
Shelf 1.00 m x 1.70 m
A
B
Room
3.00 m x 4.20 m
Chowkhat 10 cm x 8 cm
Door
Verandah 2.00 m Wide
2.00 m
Pillar 30 cm x 30 cm
1.40 m
Treads – 30 cm

Fig 2

RESIDENTIAL BUILDING





CROSS SECTION OF MAIN WALLS

CROSS SECTION AB OF VER.WALL

Doors:-
D_1 – 120 cm × 210 cm (1.20 m × 2.10 m)
D_2 – 100 cm × 200 cm (1.00 m × 2.00 m)
D_3 – 75 cm × 180 cm (.75 m × 1.80 m).

Windows:-
W_1 – 100 cm × 150 cm (1.00 m × 1.50 m)
W_2 – 200 cm × 150 cm (2.00 m × 1.50 m)
W_3 – 75 cm × 120 cm (.75 m × 1.20 m)
C.W. – 75 cm × 60 cm (.75 m × .60 m).

Shelves:-
S – 100 cm × 150 cm (1.00 m × 1.50 m)
Lintel Over Doors, Windows Etc.
15 cm R.B.

All walls of Drawing Rooms and Bed Rooms have same section

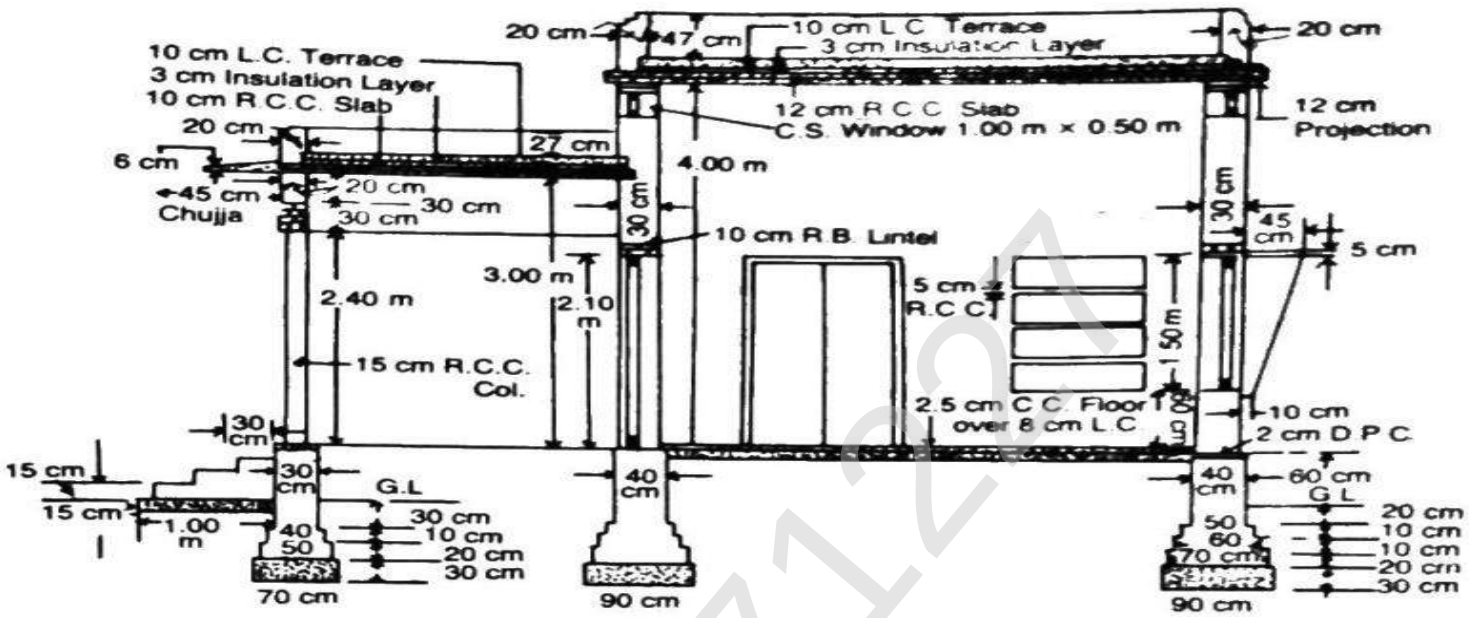
Bath Room Walls have similar section

Note—*No beam has been shown in the plan.*

fig 3

TWO-ROOM BUILDING WITH FRONT VERANDAH

CROSS-SECTION OF TWO-ROOMED BUILDING



SEC^NL ELEVATION ON CEFG

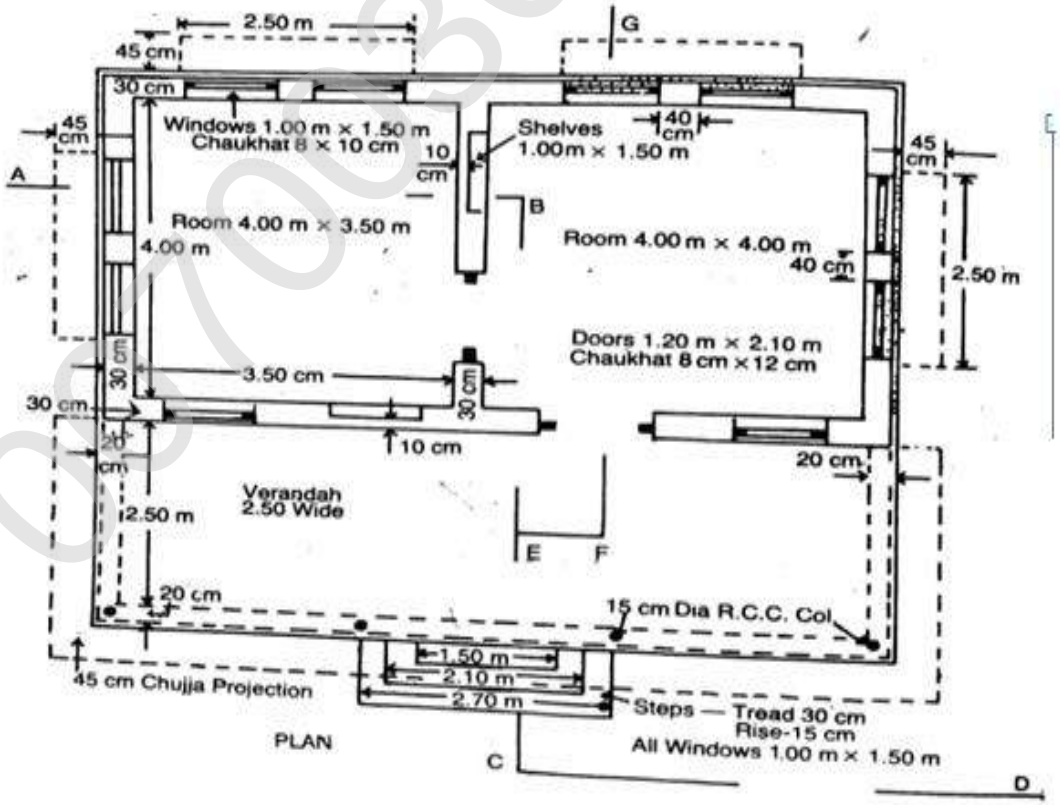


FIGURE-04

3rd Sem. Common 2021(W)

Th-5 Environmental Studies

Full Marks: 80 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.	Define acid rain.	
	b.	What is ecological succession?	
	c.	What do you mean by soil erosion?	
	d.	Define genetics and species.	
	e.	Mention any two causes of marine pollution.	
	f.	Define environment.	
	g.	What is mortality?	
	h.	What do you mean by sustainable development?	
	i.	What leads to conflicts over water?	
	j.	Define water pollution.	
2.		Answer **Any Six** Questions	6 x 5
	a.	Define and explain food chain with at least one example.	
	b.	Explain the changes caused by modern agriculture.	
	c.	Explain Biodiversity at National level.	
	d.	Give a brief note on ozone layer depletion along with its consequences.	
	e.	Discuss in brief 'Human Rights'.	
	f.	Discuss the needs of public awareness towards environment.	
	g	Explain cyclone disaster management.	
3		Explain the effects of mine extraction on environment and tribal people.	10
4		Explain different threats to biodiversity.	10
5		Describe forest ecosystem.	10
6		Write down the causes, effects and controlling measures of soil pollution.	10
7	a	Urban problems related to energy.	5
	b	Family welfare program.	5

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3RD SEM. / CIVIL / 2022(W)
Th-1 Structural Mechanics

Full Marks: 80 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. Define Hook's law.

b. Define volumetric strain.

c. What is the maximum bending moment of a simple supported beam of length 'l'& udl 'w'/unit run throughout.

d. What is point of contraflexure?

e. Define slenderness ratio .

f. What is the section modulus of a rectangular section of depth 'd' and width 'b'.

g. Write down the relation between elastic modulus and rigidity modulus.

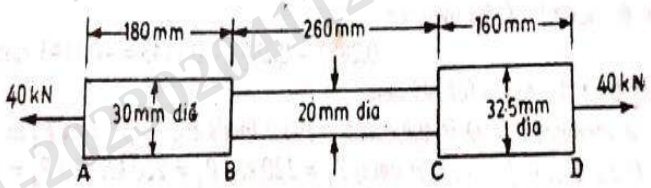
h. Write down the condition of static equilibrium.

i. Define rigidity.

j. Differentiate between statically determinate and statically indeterminate structure.

2. Answer **Any Six** Questions 6 x 5

a. The figure shows a bar consisting of three lengths. Find the stress in three parts and the total extension of the bar for an axial pull of 40 kN. Take E = $2x10^5 N/mm^2$.



b. A cantilever beam is rectangular in section having 80mm width and 120mm depth. If the cantilever is subjected to a point load of 6kN at the free end and the bending stress is not to exceed 40 MPa, find the span of the cantilever beam.

c. Derive relationship between shear force, bending moment & rate of loading.

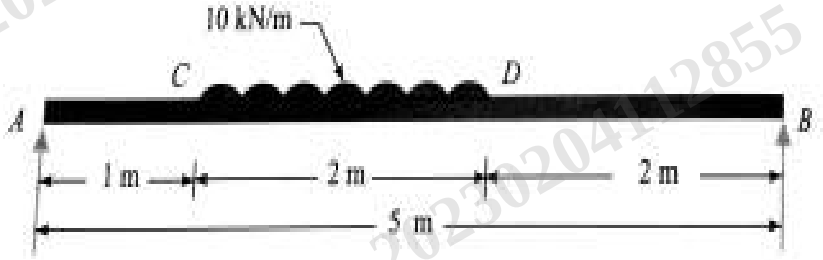
d. Write down the assumptions of pure torsion.

e. A simply supported beam of span 2.4m subjected to a central point load of 15KN. What is the maximum slope and deflection at the centre of the beam? Take EI for the beam as $6x10^{10} N/mm^2$.

f. A circular beam of 100mm diameter is subjected to a shear force of 30KN.Calculate the value of maximum shear stress and sketch the variation of shear stress along the depth of the beam.

g. A steel rod 5m long and 40mm diameter is used as column, with one end fixed and the other free. Determine the crippling load by Euler's formula. Take E as 200 Gpa.

3	Derive briefly the relation between E(elastic modulus) K(bulk modulus) & C(shear modulus).	10
4	An 'I'section has the following dimension in mm units: Bottom flange = 300x100 Top flange = 150x50 Web = 300x50 Determine mathematically the position of centre of gravity and MI of the section about horizontal axis passing through the C.G of the section.	10
5	A hollow rectangular masonry pier is 1.2mx0.8m wide and 150mm thick. A vertical load of $2x10^6$N is transmitted in a vertical plane bisecting 1.2m side and at an eccentricity of 100mm from the geometric axis of the section calculate the maximum and minimum stress intensity in the section.	10
6	A simply supported beam 5m long is loaded with a uniformly distributed load of 10kN/m over a length of 2m as in the figure.	10



7	A rectangular beam 60mm wide and 150m deep is simply supported over a span of 4m. If the beam subjected to uniformly distributed load of 4.5kn/m find the maximum bending stress induced in the beam.	10

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3RD SEM./ CIVIL/ 2022(W)

Th2 Geotechnical Engineering

Full Marks: 80 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 is density index?
   b. State stokes law.
   c. What is active earth pressure?
   d. Define air content and percentage air voids?
   e. What do you mean by dispersing agent correction?
   f. What do you mean by flow index?
   g. Write the name of tests for finding shear strength of soil?
   h. Differentiate between compaction and consolidation?
   i. What do you mean by ultimate bearing capacity?
   j. What do you mean by correction due to dilatancy and overburden?

2. Answer **Any Six** Questions 6 x 5
   a. What is scope of soil mechanics?
   b. Explain the phenomenon of quick sand.
   c. Describe gravity loading method of plate load test ?
   d. A constant head permeability test was conducted on a soil specimen has specific gravity of 2.65 and saturated water content of 20% . If the coefficient of permeability is 0.1 m/sec the seepage velocity is .
   e. Explain about standard penetration test.
   f. What are the factors affecting compaction?
   g Explain pycnometer method for determination of water content.

3 Write about IS classification of soil. 10

4 For a soil sample the specific gravity of soil mass is 1.7 and specific gravity of soil particle is 2.65 determine its void ratio 10
   a) Assuming sample is dry
   b) Sample has water content of 15%

5 A rectangular footing 2mx3m rests on c-Φ soil with its base at 1.5m below ground surface. Calculate safe bearing capacity , using factor of safety as 3 on 10
   1) net ultimate bearing capacity
   2) ultimate bearing capacity
   The soil has bulk unit weight =18kn/m^3,C=10 kn/m^3,Φ=30° use Terzaghi analysis.

6 A clay layer 4m thick is sand witched between layer of sand calculate the time the clay layer take to reach 70% consolidation. Coefficient of consolidation $=3x10^{-4}$ 10

7 Describe briefly procedure of sedimentation analysis and hydrometer method . 10

3RD SEM./ CIVIL/ 2022(W)

Th-3 Building Materials & Construction Technology

Full Marks: 80 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 are the geological classification of rocks ? Give some examples of sedimentary rocks.
   b. What are the functions of alumina and silica in brick earth ?
   c. Name the compounds formed during the setting action of cement.Mention the name of the compound to react with water at the earliest,when water is added with cement.
   d. Define water-cement ratio ? What is the effect of increasing the water-cement ratio on strength of concrete ?
   e. What is bulking of sand ?
   f. What is seasoning of timber ?
   g. As per National Building Code of India, buildings are classified into how many groups as per occupancy ? Name any four.
   h. What are the objectives of providing foundations for structures ?
   i. Differentiate between English bond and Flemish bond.
   j. Define these two terms;
      a) Baluster
      b) D.P.C.

2. Answer **Any Six** Questions. 6 x 5

   a. State the qualities of goodbricks .
   b. Define workability. Explain the Slump Test in details.
   c. Mention the qualities of good timber.
   d. Explain cast in situ terrazzo flooring.
   e. Explain different types of staircase.
   f. What are the aims of Energy Management in buildings?
   g. What are the principles of damp proofing ?

3. Breifly explain the steps involved in the manufacture of ordinary Portland cement with a neat flow diagram. 10

4. What are the various ingredients of paints? State the functions of each of them. 10

5. Briefly explain the process of manufacture of bricks in details. 10

6. Name various types of Doors. Describe any two types of doors with neat sketches. 10

7. What is green building ? Explain in details the features or principles of Green Building. 10

3RD SEM. / COMMON / 2022(W)

Th-5 Environmental studies

Full Marks: 80 Time- 3 Hours

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. Define natural resources.

   b. Write down two examples of non-renewable resources.

   c. Define soil erosion.

   d. Define producers in eco system.

   e. What is bio diversity?

   f. What do you mean by poaching of wild life?

   g. What is the unit of sound intensity?

   h. What is endangered species.

   i. Define greenhouse effect.

   j. What are the various objectives of family welfare programme.

2. Answer **Any Six** Questions 6 x 5

   a. What are the environmental effects of mining?

   b. Give a brief description of man wild life conflict.

   c. What are the effects of acid rain.

   d. Define rainwater harvesting? State the objective of rain water harvesting?

   e. Describe about Bio gas plant.

   f. Write down the role of an individual protecting environment.

   g What are the effects of modern agriculture?

3 Define Global warming, write down the causes and effect of global warming. 10

4 Explain sources of solid waste and solid waste management. 10

5 Describe aquatic ecosystem. 10

6 Write down the effect, prevention and control of noise pollution. 10

7 Write short notes on 10
   a. Pyramid of energy
   b. Green house effect

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3RD SEM./CIVIL/CIVIL[PT] 2020(W)NEW

Th1- Structural Mechanics

Full Marks: 80 **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. State the parallel axis theorem.

b. Define poisson's ratio.

c. State Hooke's law.

d. Write down the value of maximum B.M in case of a simply supported beam of length l carrying a point load of W at its centre.

e. What is Mohr's circle & write down its application.

f. Draw the shear stress distribution diagram for a rectangular section and I section.

g. What is section modulus.

h. Define torsional rigidity.

i. What is point of contraflexure.

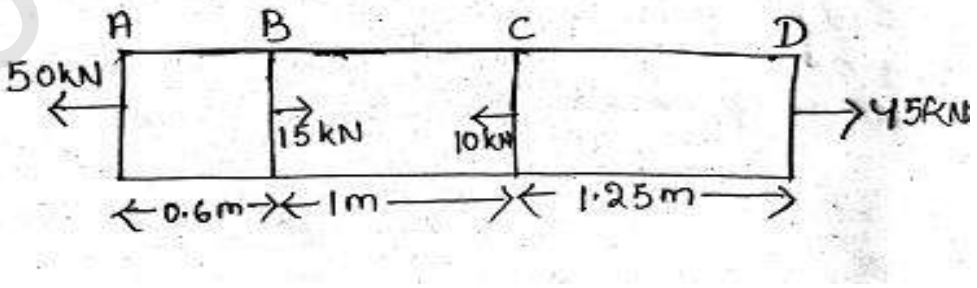
j. Differentiate between statically determinate and statically indeterminate structure.

2. Answer Any Six Questions **6 x 5**

a. Draw the neat sketch of stress strain diagram for mild steel and explain the salient points in detail.

b. A plate 2m x 2m x 20mm is subjected to stress σ_x = 100 mpa (tensile) & σ_y = 50 mpa (compressive) in the plane of the plate. Modulus of elasticity of plate is 200 x 10^3 mpa & poisson's ratio is 0.25. Calculate the change in volume of the plate.

c. A steel bar of cross section 500 mm^2 is acted upon by the forces as shown in figure. Determine the total elongation of the bar. Consider E = 2x10^5 N/mm^2



d. A rectangular beam 10 cm wide is subjected to the maximum shear force of 50 KN, the corresponding maximum shear stress being 3 N/mm^2. Calculate the depth of beam.

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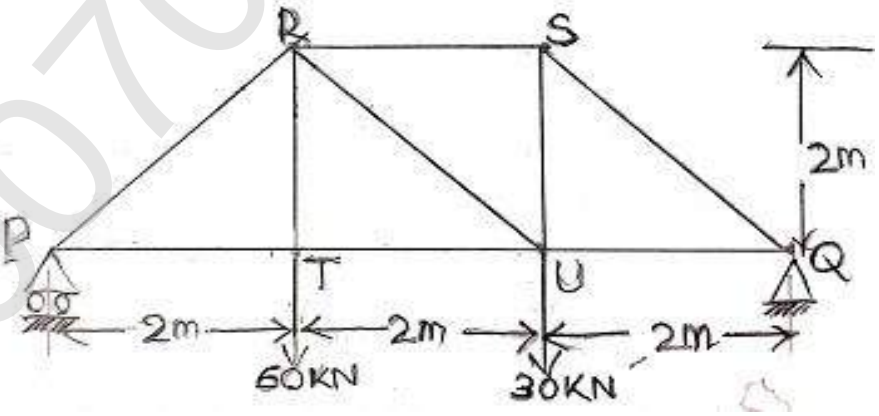
	e.	**A point in strained material is subjected to two mutually perpendicular tensile stresses of 200 mpa & 100 mpa & shear stress of 30 mpa. Determine the intensities of normal, shear and resultant stresses on a plane inclined at 60^o with the axis of major tensile stress.**	
	f.	**A steel rod 5m long & 50 mm diameter is used as column with one end fixed & other free. Determine the crippling load by Euler's formula. Take E as 200 Gpa.**	
	g	**Derive the slope and deflection of a cantilever beam with a point load at its free end by double integration method.**	
3	**(a)**	**Define principal stress and principal plane.**	**3**
	(b)	**A cantilever beam of length 5m carries two point loads of 4 KN and 6 KN acting at free end and 2m from the free end respectively. It also carries an UDL of 2 KN/m between two point loads. Draw BMD and SFD.**	**7**
4	**(a)**	**A beam of rectangular cross section is 300 mm wide and 500 mm deep. If the section is subjected to a maximum shear force of 50 KN, find the maximum shear stress & sketch the shear stress distribution along the depth of beam.**	**5**
	(b)	**Write down the assumptions in the theory of pure bending.**	**5**
5		**A cylindrical bar is 20 mm dia and 750 mm long. During a tension test, longitudinal strain was found three times the lateral strain. Calculate the modulus of rigidity and the bulk modulus, if the elastic modulus is $2x10^5$ N/mm^2. Also, find change in volume when a volumetric stress (compressive) of 100 N/mm^2 is applied.**	**10**
6		**Find the moment of inertia of a T – section with flange as 150 mm x 50 mm and web as 150 mm x 50 mm about x-x and y-y axis through the centre of gravity of the section.**	**10**
7		**Find out forces in all the members with their nature as tensile or compressive as shown in figure using method of joint.**	**10**



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3RD SEM./CIVIL/ 2020(W)NEW
Th2- Geotechnical Engineering

Full Marks: 80 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 is Quick sand condition?
b. What is Consistency Index and Liquidity index?
c. State Darcy 's Law.
d. Differentiate between Compaction and Consolidation.
e. What is Active Earth Pressure?
f. What do you mean by Zero air void line?
g. Differentiate between Shallow foundation and Deep foundation.
h. Define Air content and Degree of Saturation.
i. Define Effective Stress.
j. What is Density Index?

2. Answer **Any Six** Questions 6 x 5

a. Describe different types of failure in case of foundation.
b. In a falling head permeability test, the head causing fall was initially 90 cm, and it drops 6cm in 15 minutes. How much time is required for the head to fall to 45 cm.
c. Describe different methods of compaction.
d. A soil sample has wet density of 20 kN/m^3 and dry density of 18 kN/m^3. If the specific gravity of soil is 2.67, calculate the void ratio, porosity, moisture content and degree of saturation. Assume unit weight of water is 10 kN/m^3.
e. Explain Mohr-Coulomb's failure theory.
f. Define Optimum Moisture Content and also describe the factors affecting Compaction.
g Describe different factors affecting permeability .

3 Explain in detail Triaxial shear test of soil with neat sketch. 10

4 (a) A square footing 3m by 3m is built in a homogenous bed of sand of unit weight 21 KN/m^3 and having an angle of shearing resistance of 36°.The depth of the base of footing is 1.8 m below the ground surface. Calculate the safe load that can be carried by a footing with a factor of safety of 3 against complete shear failure. Use Terzaghi's analysis.(N_c=65.4, N_q=49.4, N_γ=54) 07

(b) Write down different types of shallow foundation 03

5 Describe in detail Terzaghi's spring analogy for primary consolidation with neat sketches. 10

6 What is wet mechanical analysis. Explain briefly Pipette method with neat sketch. 10

7 (a) Define Consistency of soils and Atterberg limits. 04

(b) A sampler with a volume of 60 cm^3 is filled with saturated soil sample. The specific gravity of soil solid is 2.65. When the oven dry soil is poured into a graduated cylinder filled with water, it displaces 40 cm^3 of water. What is the natural moisture content and dry unit weight of soil? 06

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3RD SEM./CIVIL/ 2020(W)NEW

Th3- Building Material and Construction Technology

Full Marks: 80 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 is the use of frog in a brick?
   b. What do you mean by water cement ratio?
   c. What is igneous rock?
   d. What is seasoning of timber?
   e. What is the use of 'vechile' in a paint?
   f. Define foundation.
   g. What is stretcher and header in a brick masonry?
   h. What is D.P.C and why it is provided?
   i. Define dog legged stair?
   j. Define the term 'Dado' in plastering work?

2. Answer **Any Six** Questions 6 x 5
   a. What are various methods adopted in manufacturing of bricks. Explain kiln burning process.
   b. Discuss the geological classification of rocks.
   c. Define and explain workability of concrete.
   d. State briefly the requirement of good staircase?
   e. Draw the plan of alternate course in English bond '1-brick thick wall'.
   f. Explain the method of constructing cement concrete flooring.
   g Describe briefly different methods of damp proofing.

3 Name and explain different ingredients and their function in cement. What are different types of cement available in India where they are used? 10

4 Explain different types of shallow foundation in detail with neat sketch? 10

5 Classify with the help of figure various types of windows based on their method of operation or opening? 10

6 What is green building? Explain in details the features or principle of green building. 10

7 What are the various ingredients of paints? State the functions of each of them. 10

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3RD SEM./ CIVIL / 2020(W)NEW

Th4 Estimation & Cost Evaluation- I

Full Marks: 80 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. Define Depreciation and Obsolescence.
b. Write down the volume and weight of one bag of cement.
c. Write down the unit of following items.
(i) Earthwork in filling (ii) lime concrete terracing
d. Define floor area of a building.
e. What do you mean by lead and lift?
f. Calculate the standard weight of 20mm diameter bar of 1 meter length.
g. What do you mean by sinking fund?
h. What do you mean by AR estimate?
i. Draw the details of measurement form used in estimate.
j. Classify the labours as per OPWD and also mention their rates.

2. Answer **Any Six** Questions 6 x 5

a. Write the duties of Junior Engineer.
b. Calculate the dry materials required for 500m^2 of cement plaster (1:6) of 12mm thickness.
c. Describe briefly about different types of values of a structure.
d. Calculate the cost of construction of 8 m^3 of brickwork (1:4) using standard bricks of size 19c.m×9c.m×9c.m .Use latest OPWD rates
e. Differentiate between Plinth area estimate and cube rate estimate.
f. Calculate the quantity of woodwork in frames of 2 doors and 3 windows having following specifications
Size of door = 1.2m ×2m , size of window = 1×1.5m
Size of chowkath = 10 c.m×8 c.m.
g What do you mean by analysis of rate? Write the purpose of analysis of rates.

3 Prepare the quantity estimate for the following items from the given drawing in Fig-1.
(a)Earthwork in excavation in foundation 5
(b)1st class brickwork in foundation and plinth(1:3) . 5

4 Prepare the quantity estimate for the following items from the given drawing in Fig-1.
(a)First class brickwork in superstructure (1:3) 7
(b) 2.5 c.m dpc work (1:2:4) 3

5 (a) Calculate the dry materials required for the quantity of items calculated for Q 4(b) . 5
(b) Analyse the rate of materials and labours as per OPWD for Q .4 (a). 5

6 Write the role of following persons.
(a)Divisional accountant 5
(b) Executive engineer 5

7 Describe briefly about different types of estimates. 10

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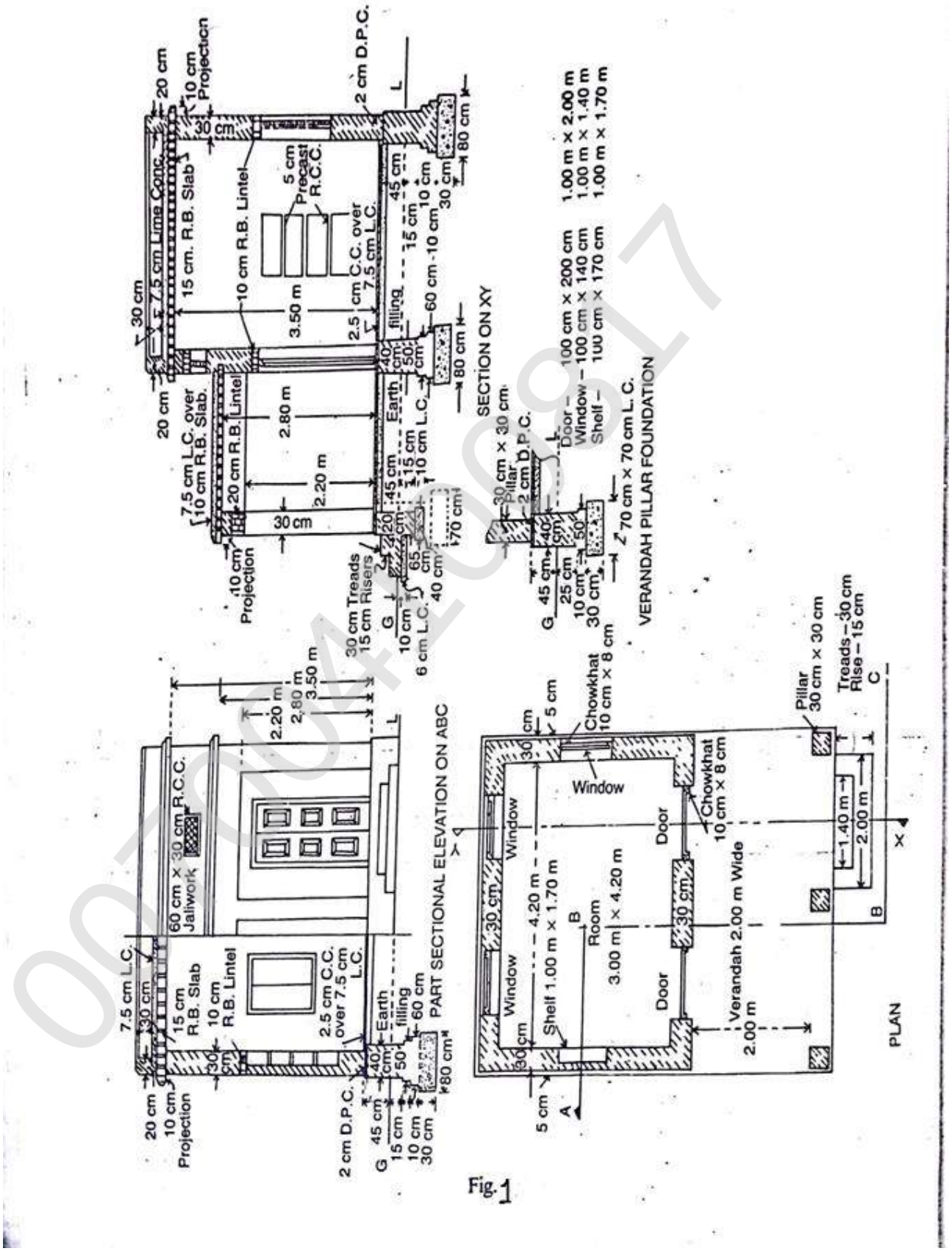

Fig. 1

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3RD SEM./COMMON /ALL Branches 2020(W) NEW

TH 5 Environmental Studies

Full Marks: 80 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. Define Environment.
   b. Define deforestation.
   c. What do you mean by decomposers?
   d. What are hot spots of biodiversity?
   e. Define eco system.
   f. Write down psychological effect of noise pollution.
   g. What is solid waste management?
   h. Define green house effect.
   i. What are the major reasons of population explosion?
   j. What is Draught?

2. Answer **Any Six** Questions 6 x 5

   a. What are causes of deforestation.
   b. What are the environmental effects of mining.
   c. Give a brief description about structures of a pond eco –system.
   d. Discuss about 3R in controlling environmental pollution.
   e. What is global warming ? Write down the effects of global warming?
   f. Discuss about rain water harvesting?
   g. What is the role of an individual in controlling pollution of environment?

3 What is the need of land resources? Write the main reasons of degradation of land? 10

4 What are the changes made in agriculture? Write down the impacts of modern agriculture on environment? 10

5 What are ecological pyramids? Explain the pyramid of number and pyramid of energy? 10

6 Explain the sources of solid waste and solid waste management? 10

7 Write short notes on 10

   a. World food problem
   b. Acid rain

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