Total No. of Printed Pages:2

SUBJECT CODE NO:- H-488
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (Civil)
Advanced Surveying
(OLD)

[Time: Two Hours]   [Max.Marks: 40]

Please check whether you have got the right question paper.

N.B   1. Q.No.1 and Q.No.5 are compulsory.
        2. Answer any two questions from section A and section B.
        3. Figures to right indicate the maximum marks.
        4. Assume suitable data if necessary, and state the same very clearly.

Section A

Q.1   Answer the following question: (any three)   06
        a) What is aerial photogrammetry?
        b) Scale and Distortion of the vertical photograph?

        c) Explain: - Drift and Crab.

        d) Define:-
            i)   Principal point
            ii)   Isocenter

        e) Write uses of Hydrographic surveying.

Q.2   Define relief. Derive an expression for displacement due to ground relief.   07

Q.3   Explain the principal and working of a parallax bar.   07

Q.4   A line AB measures 12.00cm on a photograph taken with a camera having a focal length of 22.5cm.   07
       The same line measures 3cm on a map drawn to scale of 1/46000. Calculate the flying height of the
       aircraft, if the average altitude is 350m.

Section B

Q.5   Answer the following question: (any three)   06
        a) Explain the basic concept of GIS?
        b) Define:-
            i)   Nadir point
            ii)   Oblique Photograph
        c) What do you understand by electromagnetic spectrum?
        d) Write down main five components of GIS?
        e) Define remote sensing. State how it differs from photogrammetry.

1

Q.6   Describe the radial line method of plotting from aerial photographs.   07

Q.7   Explain in details the use of EME (electromagnetic energy) and its use in Remote Sensing   07
       Techniques?

Q.8   Write a note on application areas of GIS and remote sensing?   07

2

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-498
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Transportation Engineering-II
(OLD)

[Time: Three Hours]   [Max.Marks:100]

Please check whether you have got the right question paper.

N.B   i) Attempt any three questions from each section.
              ii) Figure to the right indicates full marks.
              iii) Assume suitable data if necessary.

Section A

Q.1   (a) Explain salient feature of Bombay road plan.   08
      (b) Explain with neat sketches the various factors controlling the alignment of roads.   08

Q.2   (a) Calculate the absolute minimum and ruling gradient of horizontal curves for a design speed 08
          of 80 kmph
      (b) Derive an expression for finding the extra widening required on horizontal curve.   08

Q.3   (a) Explain in detail I.S. Soil Classification for road construction.   08
      (b) Explain with neat sketches CBR test.   08

Q.4   (a) The CBR values of subgrade soil is 5%, Calculate total thickness of a pavement using   08
          (i)   design curve developed by California state highway Department.
                  Assume 4100 kg wheel load.

      (b) Explain with neat sketches longitudinal and transverse joints in Rigid pavement.

                                                                                                            08

Q.5   Write Notes on Following (any three)   18
          i)   Vision 2021-details of recommendations
          ii)   PMGSY
          iii)   Super elevation of highway
          iv)   Earth moving equipment.

Section B

Q.6   (a) Explain shape test an aggregate with neat sketches.   08

       (b) Write a detailed on Marshall stability test for mix design.   08

Q.7   (a) How is the runway Lighting decided? What are geometric design consideration in runway.   08

       (b) Explain the various types of Failures in Cement concrete pavements and their causes.   08

Q.8   (a) Explain material specification and construction method of built-up-spray grout layer.   08

       (b) Explain grade separated intersections, the advantages and limitations.   08

Q.9   (a) What is tunnel lining? Explain in detail classification of tunnel lining.   08

       (b) What are various methods of tunnel construction? Explain any two methods of construction   08
          with neat sketches.

Q.10   Write a Short notes on following (any three)   18

       i)   Bitumen bound Macadam

       ii)   Evaluation of wheel Load Stresses for design

       iii)   Construction procedure for Earth Road.

       iv)   Components of heliport.

2

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-157
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (Civil)
Geotechnical Engineering
(OLD)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
1) Q.1 & Q.6 are compulsory. Solve any two questions from remaining questions in each section.
2) assume suitable data if required state it clearly.

Section - A

Q.1   Attempt any five.   10
   a) What is the value of plasticity for sandy soil? Explain briefly.
   b) Define compaction & consolidation.
   c) Following are the symbols, what they represent?
      - SS & CS
      - SM & CS

   d) Co-relate relation between grain size & voids ratio.
   e) When deposition is takes place with flocculated structure?
   f) State the different modes of soil water.
   g) Define coefficient of compressibility & coefficient of volume change.

Q.2   a) Describe square root time fitting method.   07
      b) Explain highway research board classification.   08

Q.3   a) Discuss laboratory consolidation test.   07
      b) Sketch the plasticity chart. Explain its use in engineering classification of fine grained   08
         soil with reference to IS classification.

Q.4   a) A laboratory compaction test on a soil having specific gravity 2.71 gave a maximum dry   08
         density of 1.99 gm/cm^3 & water content of 18.5%. Determine the degree of saturation, air
         content and percentage air voids at the maximum dry density.
      b) Discuss mechanical stabilization of soil.   07

Q.5   Short notes. (Any three)   15
      a) Assumptions made in Terzaghi's theory & its limitation.
      b) Falling head method to find 'K'.
      c) Atterberg's limit.
      d) Compaction of soil on field.
      e) Spring analogy of consolidation.

1

Section - B

Q.6　　Attempt any five.　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　10
   a) Define earth pressure due to backfill.
   b) Draw diagram showing vertical pressure distribution under uniformly distributed load.[for circular area]
   c) Draw contact pressure distribution under rigid footing for saturated clay and cohesion less sand.
   d) Find the value of K_p & K_a if $\Phi = 45°$.
   e) Write down the expression to calculate factor of safety against sliding for cohesion less & cohesive soil for infinite slopes.
   f) Define finite and infinite slope.
   g) Enlist the test used to determine shear strength in laboratory.

Q.7　　a) Design a gravity retaining wall 5m height with vertical back to retain a dry cohesion less　10 backfill of unit weight $\frac{18\,KN}{ms}$ & angle of shearing resistance 30°. Find factor of safety against sliding also. Assume friction between base of the wall & the foundation soil as 30°. The wall is to be 1m wide at top, & to be constructed of brick masonry having unit weight 20KN/m^3 use Rankine's theory –
   　　05
   b) Assumptions made in Rankine's theory.

Q.8　　a) Enlist type of failure of finite slope may occurs. Discuss $C - \Phi$ analysis of Swedish slip　08 circle method.
   b) Explain Newmarks's influence chart.　　　　　　　　　　　　　　　　　　　　07

Q.9　　a) Two point loads P & Q act on the ground surface 8m apart. The magnitude of P is 100KN　10 & that of Q is 80KN. Point A is at a depth of 6m directly below P and point B is at a distance of 4m from P. Point C lies at a depth of 3m below the ground surface. Calculate the increase in vertical stresses at A,B & C due to the point l load.
   b) Discuss general principle of drained, consolidated un-drained & drain tests.　　　05

Q.10　　Attempt any three　　　　　　　　　　　　　　　　　　　　　　　　　　　　15
   a) Explain friction circle method.
   b) What are the factor affecting the slope failure?
   c) Differentiate between finite & infinite slope.
   d) Draw the sketch represents the earth pressure
   e) When do you use the following shear tests and give reasons briefly.
     - Shear box
     - Vane shear test
     - Unconfined compression test

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-146
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Construction Management
(REVISED)

**[Time: Three Hours]**   **[Max.Marks: 80]**

Please check whether you have got the right question paper.

N.B   1. Solve any three questions from each section.
         2. Figures to right indicate the maximum marks.

Section A

Q.1   a) List out the rights and responsibilities of project manager.   07
         b) State the objectives and explain the function of construction management.   06

Q.2   a) Explain in brief various parts of dragline with sketch.   07
         b) Describe in brief the term project initiation and project implementation.   06

Q.3   Figure shows a network for a construction project with the three times estimates of each activity.   13
         Determine:
         i)   Critical path and standard deviation
         ii)   Probability of completion of project in 40 days
         iii) Time duration that will provide 95% probability of its completion on time.
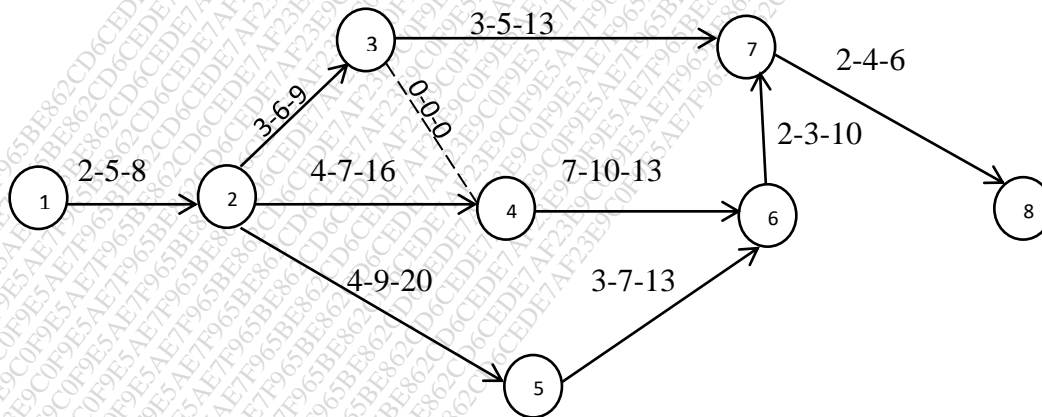
Q.4   a) Distinguish between PERT and CPM.   07
         b) Network rules   06

Q.5   Write short notes on any two   14
         i)   Bar chart
         ii)   Cost optimization
         iii) Dummy
         iv)   Time estimate in PERT

1

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Section B

Q.6	a)	Enlist the different investment Criteria method? Explain any one in detail.	07
	b)	Describe the term cost of project.	06
Q.7	a)	Describe in details tools used for safety in construction project.	07
	b)	Explain minimum wages act.	06
Q.8	a)	Explain the term Downward and Horizontal communication.	07
	b)	Explain in detail barrier in communication.	06
Q.9	a)	Explain in detail "Economic Order Quantity"	07
	b)	A construction company purchases 1000 bags of cement annually. Each bag of cement costs Rs 200 and the cost incurred in procuring each lots is Rs 100. The cost of carrying is 25%. What is the most economic order quantity? What is the average inventory level?	06

Q.10   Write short notes on any two   14
        i)   Net Present Value
        ii)   ABC Analysis
        iii)   Software use in project planning
        iv)   Oral Communication

Total No. of Printed Pages:2
SUBJECT CODE NO:- H-132
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Building Construction & Drawing
(OLD)

[Time: Three Hours]   **[Max. Marks: 80]**

Please check whether you have got the right question paper.
N.B
    i.   Q.No.1 and 6 are compulsory.
    ii.   Solve <u>any two</u> questions from question no. 2 to 5 and <u>any one</u> from question no. 7 to 8.
    iii.   Figures to right indicate the maximum marks.

SECTION A

Q.1	Attempt any FIVE	10
	a) What is the difference between load bearing wall and partition wall?	
	b) What are the features and applications of HDPE wall pannel.	
	c) Define Internal & External privacy. How it can be achieved?	
	d) List out the details which are provided in a submission drawing.	
	e) Define energy efficient buildings and list down its advantages.	
	f) Define safe bearing capacity of soil. List any two type of rock/soil with values of SBC as per IS.	
	g) List down the various types of material used in damp proof course	

Q.2	a) Enlist various types of building components and explain any one in detail with requirement	08
	b) Explain with neat sketch in detail cement concrete partitions and asbestos cement partitions	07

Q.3	a) List out various types of principles of building planning and explain any two principles in detail.	08
	b) Explain how the building bylaws affect the planning of residential buildings.	07

Q.4	a) Explain with neat sketch different types of raft foundations?	08
	b) Explain in detail post-construction treatment of termite proofing.	07

Q.5	Write a short note on (any three)	15
	a) Types of building as per NBC(SP-7-2005)	
	b) Working drawing	
	c) Excavation for foundations	
	d) Fire proof construction	
	e) Expansion & construction joints	

1

H-132

SECTION B

Q.6 Draw a plan of residential bungalow for a family in new Aurangabad town.   25
   a. Plot size 9m × 12m
   b. Scale 1:50
   c. plinth height 0.6m
   d. Required components: Ent. Verandah, Living Room, Bedroom, master bed, Separate W.C, bath, kitchen-cum-dining room, store room & stair case-doglegged. Draw: Working plan, Elevation, Section through W.C/bath & staircase, Schedule of opening, Area statement (block plan calculations)

Q.7 a) Differentiate between: (i) Quarter turn stair and bifurcated stair   08
                           (ii) Helical stair and spiral stair.
     b) Write a short note on repairs and retrofitting in building.   07

Q.8 a) Discuss how safety in construction site can be achieved.   08
     b) What are the points are to be kept in mind while locating doors and windows.   07

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-131
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Building Construction & Drawing
(REVISED)

[Time: Three Hours]   **[Max. Marks: 80]**

Please check whether you have got the right question paper.

N.B   1) Q. No. 1 and Q. No. 6 is compulsory.
             2) Solve any two questions from remaining of Section A & B.

Section A

Q.1   Attempt any five of the following:-   10

1) What is the necessity of providing foundation to structure?
2) Enlist different types of foundation.
3) Explain building line.
4) Define control line.
5) Define built up area.
6) Define deep foundation.
7) Define Underpinning.

Q.2   a) What are the different types of building explain any two in detail.   08

         b) Classify building as per national building code and explain any two in detail.   07

Q.3   a) What are the different planning principal, explain any two in detail.   08

         b) Write in detailed about partition wall.   07

Q.4   a) Write a detailed note on underpinning with neat sketches.   08

         b) Explain in detail about pile foundation.   07

Q.5   a) What do you understand by setting out of foundation? Explain with neat sketch.   07

         b) Enlist the causes of failure of foundation. Explain any two in detail.   08

Section B

Q.6   Attempt <u>any five</u> of the following:-   10

1) Define termite proofing.
2) Define damp proofing.
3) Define sound proof construction.
4) Explain types of Joints in construction.
5) What is pitch?
6) What is rise and tread?
7) What are different types of windows?

Q.7   a) Explain in detail about termite proofing.   08

b) Explain in length cavity walls & its features.   07

Q.8   a) Explain in detail about shoring.   05

b) Plan a doglegged stair of building having height 3.6m and stair measures.[2.5M×5M]   10

Q.9   Draw a working plan of building for scale 1:50 draw section through stairs and elevation for given   15
data.

1)   Plot area 10m×15m
2)   Side Margin 1m each
3)   Front Margin 2.5m
4)   Back Margin 1.5m
5)   FSI = 0.75

Requirement: - Drawing Hall, Bedroom, Master Bedroom, Separate WC & Bath, Kitchen cum
Dining room, Doglegged stairs also show Schedule of Opening and Construction Notes.

Q.10   a) Discuss wall cladding its material and methods.   08

b) Explain Scaffolding its type and suitability.   07

H -123

Total No. of Printed Pages:2

SUBJECT CODE NO: H -123
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (Civil)
Design of Structures - II (RCC)
(OLD)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
i.   Question No. 1 and 6 are compulsory. Answer any two from section A & section B.
ii.   Assume suitable data if necessary.
iii. Figures to right indicate the maximum marks.
iv.   Use of non – programmable calculator is allowed.
v.   Use of IS: 456 – 2000 is permitted.

Section A

Q.1   a)   What are the advantage and disadvantages of providing large clear cover to reinforcement   03
           in flexural member?
      b)   Enumerate the different types of limit state with brief description.   04
      c)   Why is the provision of minimum reinforcement in Reinforced concrete beam?   03

Q.2   Design simply supported beam of span 5M. is to carry A uniform dead load of 20KN/M. and   15
      uniform live load of 30KN/M. the width of the support is 230mm. assume M – 25 concrete and
      Fe – 415 steel.

Q.3   Design cantilever beam of span 3-0 Mt. is to carry A uniformly distributed load of 20 KN/M. the 15
      width of the support is 230mm. assume M – 25 concrete and Fe- 500. Show the curtailment of
      reinforcement.

Q.4   a)   What is mean by cracking? Explain the types of cracks.   03
      b)   A rectangular beam of span 7M c/c resting on 300mm wide simple supports is to carry a   12
           superimposed load of 35KN/M design the Beam it is restricted to 550 MM.
           Use M20 and Fe415 grade.

Q.5   An Isolated simply supported T – Beam has flange width 2300MM and flange thickness of   15
      120MM, the effective span of the beam is 3.5 meter. The effective depth of the beam is 580MM
      and width 300MM. the beam having the reinforcement with 8 – 20 MM Tor use M20 and Fe 415
      grade determine the moment of resistance of the section.

1

H -123

Section B

Q.6 Explain the following terms. 10
   a) Development length and necessity of the check.
   b) Necessity of torsion reinforcement in the slab.
   c) Relationship for the load carrying capacity of an axially loaded short column.
   d) One – way slab and Two – way slab.

Q.7 Design a reinforced concrete slab for a room $4.2M \times 6.5M$ supported on a beam of Width 15 250MM.the slab is continuous over left support and downward direction in plan, carrying a live load of $4KN/M^2$ & floor finish $1.0\ KN/M^2$ assume M – 20 grade concrete & Fe – 415 grade steel.

Q.8 Design a dog legged stair case for a residential building having a room size $5m \times 2.5M$. Floor to 15 floor height is 3M. The column size $230MM \times 380MM$ take live load $3KN/M^2$ & floor finish load $0.9KN/M^2$ Use M20 and Fe – 415 grades.

Q.9 Design isolated footing for rectangular column $230mm \times 500mm$ reinforced with 8 bars of 15 20mm diameter. And carrying axial factored load of 2000KN, SBC of soil is $250KN/M^2$ at a depth of 2.0m below ground level. Assume M25 grade of concrete & Fe- 415 grade of steel. Show the reinforcement in details.

Q.10 Design a rectangular column subjected to ultimate load of 2000KN. The column is 4.5M long & 15 effectively held in position at both ends but not restrained against rotation.
Take M- 20 & Fe – 500 grades.

Total No. of Printed Pages:3

SUBJECT CODE NO:- H-113
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Structural Mechanics
(REVISED)

[Time: Three Hours]   [Max. Marks: 80]

Please check whether you have got the right question paper.

N.B
      i)Question no 1 and question no.6 are compulsory.
      ii) Solve any two questions from question no.2 to 5 and any two from question no.7 to 10.
      iii) Figures to right indicate the maximum marks.
      iv) Use of non-programmable calculator is permitted.
      v) Assume suitable data if necessary and mention it clearly.

Section A

Q.1   Write short notes on   10
      a. Plane strain problem and plain stress problem.
      b. What is state of stress and state of strain?
      c. Assumptions of Kirchoffs thin plate theory.

Q.2   a. Explain different boundary conditions of thin plate?   08
      b. Given the following system of strains.   07

$$\mathcal{E}x = x^3 + x^2y^3 - xy^3 + y^2 - 05$$
$$\mathcal{E}y = xy^2 + x^3 - y^5 - xy^2 - 02$$
$$\gamma xy = 5xy(x^4 - 5x - 5y) + 10$$
$$\mathcal{E}z = \gamma zx = \gamma zy = 0$$

Find the displacement components in terms of x and y, assuming that the displacement and rotation at the origin is zero. Boundary condition at (x, y)=0, displacement (2,3)=0

Q.3   With usual notations, starting from slope curvature relations derive governing differential equation of thin rectangular plate subjected to transverse load 'q' per unit area.   15

Q.4   Derive with usual notations, governing differential equation of bending of circular plates. Hence write the solution for circular plate subjected to point load at centre with simply supported edge over periphery.   15

Q.5   a. Derive governing differential equations of equilibrium for a two dimensional state of stress in static condition.   08
      b. The strain components at a point in a body subjected to two dimensional state of stress are given by   07

$$\mathcal{E}xx = 2x^3 + x^2y^2 - yz^2 - 3$$

1

$$\mathcal{E}yy = 4xy^3 + x^3z^2 + yz^2 - 6$$

$$\mathcal{E}zz = 4xy^3 + x^2y^2 + 2xz - 6xzy^3$$

$$\gamma xy = x^3y^2, \gamma yz = 5zy^2, \gamma xz = 2x^2z^2$$

Determine the state of stress at point (2,-3, 2). Use $E = 2.1 \times 10^5 \, MPa \, \& \, \mu = 0.20$

Section B

Q.6   Any Two   10
   a.   What is difference in between static indeterminacy and dynamic indeterminacy?
   b.   What is difference in between plates and shells?
   c.   Draw Pascal's triangle?

Q.7   Explain membrane theory of thin spherical shells and hence derives expressions for the membrane 15
       forces in the spherical shells.

Q.8   a.   Give stepwise procedure of analysis of structures using flexibility matrix method?   08
       b.   Write down stepwise procedure adopted in finite element method of structural analysis?   07

Q.9   Draw the BMD of the continuous beam shown in fig.1 by stiffness matrix method.   15

Fig .1

2
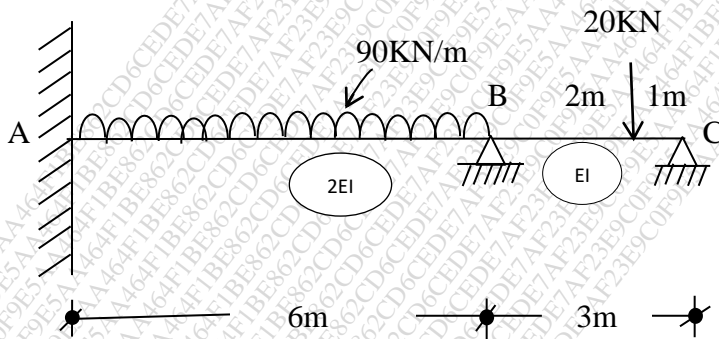
Q.10   Draw the BMD of the frame as shown in fig.2 by using stiffness matrix method.   15

Fig.2

3
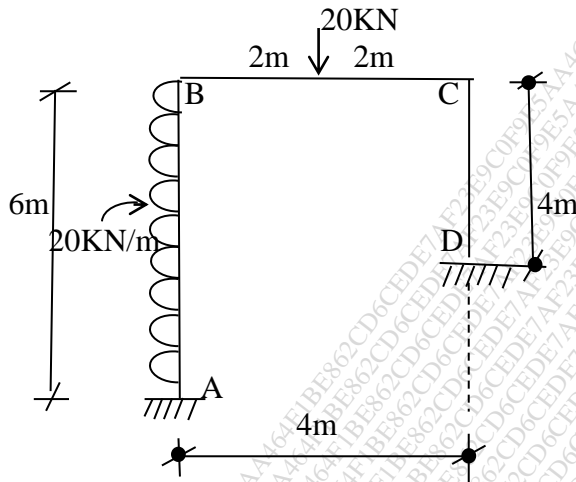
Total No. of Printed Pages:2
SUBJECT CODE NO:- H-228
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil/Mech/EE/ECT)
Elective-II: SAP Material Management - II
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.
N.B
    i.   Question no. 1 and question no. 6 compulsory.
    ii.   Solve any two questions from remaining question from each section A and B.

Section A

Q.1   What is inventory management? Explain with scope and features.   10

Q.2   a) What are different steps in automatic generation of purchase order? Explain.   08
        b) How to create good receipt explain with the help of block diagram?   07

Q.3   a) What is the use of transfer posting in SAP material management?   08
        b) What is difference between stock transfer and transfer posting?   07

Q.4   a) Explain invoice verification with the help of block diagram.   08
        b) Explain the steps to configuring material master.   07

Q.5   Write short note on (any three)   15

    a) Subcontracting
    b) Vender consignment
    c) Cycle counting and inventory sampling
    d) Version management
    e) Delivery completed indicator

Section B

Q.6   What is physical inventory? Explain scope and function.   10

Q.7   a) Explain physical inventory process cycle flow.   08
        b) What is account assignment category in material management?   07

1

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| Q.8 | a) | How to create material master data? | 08 |
| | b) | What are different organizational unit in SAP material management? | 07 |

| Q.9 | a) | How to configure account determination? | 08 |
| | b) | What is the use for account determination SAP material management? | 07 |

Q.10   Write short note on (any three)   15

        a) Field selection in material master
        b) Valuation class
        c) Periodic processing
        d) Split valuation
        e) SAP stock overview

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-219
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Elective-II: Industrial Waste Treatment
(REVISED)

[Time: Three Hours]   [Max. Marks: 80]

Please check whether you have got the right question paper.

N.B
1. Q.no.1 of section A and Q.no.6 of section B are compulsory
2. Answer <u>any two</u> questions among the remaining questions (i. e 2 to 5) of section A <u>and any</u> two questions (i. e 7 to 10) of section B
3. Assume suitable data mention it clearly

Section A

Q.1   Answer the following questions   10
   a) Name various chemical pollutant
   b) Complete the following reactions Acid + Base $\longrightarrow$ ------ + ----.
   c) Explain preventive Approach of waste Minimization.
   d) Define $\in IA$
   e) What are 3R's waste Hierarchy

Q.2   a) State and explain various needs of water pollution control Acts   07
        b) What are responsibilities of state and central pollution content Board?   08

Q.3   a) Explain any five ways of reducing strength of waste.   07
        b) What is equalization and neutralization with reference to its necessity and suitability?   08

Q.4   a) Explain importance and scope of $\in IA$ in detail.   08
        b) Explain EIS   07

Q.5   Write short note on (any 3)   15
   a) Streeter and Phelps DO model
   b) ISI standards for disposal of industrial waste
   c) By-product recovery
   d) Energy Audit of industries

1

Section B

Q.6   Answer the following questions   10
   a) How is granulated sugar classified
   b) What is Bagasse where is it used
   c) Define electroplating process
   d) Influent BOD of a waste water entering into specific treatment is 800mg/L and effluent
      BOD of waste water coming out is 40mg/L what is efficiency of that specific treatment
   e) Give full form of following abbreviations
      i)   UASBR
      ii)   SRT

Q.7   a) Draw and explain flow diagram of treatment of waste in sugar industry   07
      b) Draw and explain flow diagram for manufacturing process in textile industry.   08

Q.8   a) Explain various design parameter of High rate anaerobic filter.   07
      b) Compare the volume required for ASP and oxidation pond for the following data   08
         Population = 20,000; per capita sewage contribution = 150 LPCD; BODS of raw
         sewage = 500mg/L; Efficiency of primary treatment – BOD5 removal = 35% conditions
         prevailing- cold climatic conditions

Q.9   a) What is Nitrification and Denitrification   08
      b) What are various treatment methods for industrial waste water   07

Q.10 Write short notes on (any 3)   15
      a) Reverse osmosis
      b) Activated sludge process
      c) Radio – Active waste
      d) Electroplating industry

Total No. of Printed Pages:3

SUBJECT CODE NO:- H-218
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Elective-II: Earthquake Engineering
(REVISED)

[Time: Three Hours]   [Max.Marks: 80]

Please check whether you have got the right question paper.

N.B
1) Attempt any two questions from each section for forty marks
2) Assume suitable data if required & state it clearly
3) Use of IS:1893-2002, IS:4326:1993 & IS 13920:1993 are allowed

SECTION A

Q.1   a) Write a short note on elastic rebound theory.   05
        b) Explain peak ground motion parameters   10
        c) List out the high intensity earthquake occurred in past history in India. Explain any one.   05

Q.2   a) What is vibration? State the consequences of vibrations in a structure   05
        b) Define frequency , Natural time period, Oscillation, Amplitude & Damping   05
        c) What is mean by degree of freedom? Explain briefly SDOF & MDOF.   05
        d) Derive $w = \sqrt{k/m}$ 05

Q.3   a) Derive the expression of displacement for the free damped SDOF system. Also discuss the   12
           critical damping, under damped and over damped system.
        b) What do you mean by dynamic response?   03
        c) Explain factor affecting the ground motion   05

Q.4   a) Consider the system as shown in figure. If K_1=2000N/m, K_2=1.5 KN/m, K_3=3 KN/m,   12
           K_4=K_5=500N/m, calculate the mass if the natural frequency of the system is 10 Hrz.

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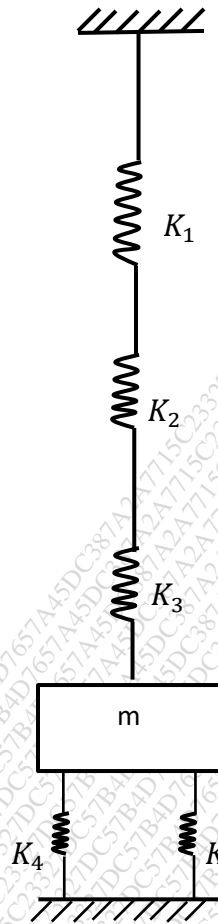
b) Define system in series and system in parallel To calculate equivalent stiffness   03
c) Explain briefly different earthquake waves   05

Q.5   Attempt any four   20
a) State Duhamel's integral & explain any one application of it.
b) Explain response spectrum & factor affecting response spectrum.
c) Differentiate between magnitude & intensity
d) Explain ground motion and its effect
e) Explain causes of earthquake

SECTION B

Q.6   a) Explain seismic design philosophy.   05
b) Explain design spectrum.   05
c) Write a short notes on soft storey failure   05
d) Discuss about the peak ground acceleration   05

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Q.7	a)	Explain the different types of irregularities & its effect on seismic analysis	10
	b)	Discuss diaphragm discontinuity	05
	c)	Write a short note on curvature ductility	05
Q.8	a)	List out the codal provisions as for architectural consideration & structural design consideration of masonary structure as per IS 4326:1993	10
	b)	Explain the factor affecting ductility	05
	c)	What is importance of ductility in earthquake resistant design	05
Q.9	a)	List out the methods adopted to reduce liquefaction	05
	b)	What are the methods to reduce liquefaction? Explain any one briefly	05
	c)	What is zero period acceleration & peak ground acceleration?	05
	d)	Write a short note on mechanism of base isolation briefly	05
Q.10	a)	Discuss briefly about the methods of seismic analysis.	05
	b)	A three storeyed symmetrical R.C school building situated at Bhuj has following configuration.	15

Plan dimension: 10m in x & 8 m in y

Story height: 3.5m

Total Beam weight in a storey=130KN

Total weight of slab in a storey=250KN

Total weight of columns in a storey=50 KN

Total weight of wall in a storey=530 KN

Live load $\longrightarrow$ 4KN/m^2

Weight of terrace floor =655 KN.

If the structure resting over hard rock find the total base shear & lateral loads at each floor level for 5% of damping using seismic coefficient method.

3

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-217
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Elective-II: Pavement Design
(REVISED)

[Time: Three Hours]   **[Max. Marks: 80]**

Please check whether you have got the right question paper.
N.B
1) Attempt <u>any three</u> questions from each section.
2) Assume suitable Data whenever necessary.
3) Figures to the Right indicate full marks.

Section A

Q.1	a)	Explain the different types of traffic loading considered in design of pavement.	07
	b)	Explain the AASHTO Road lost study in detail.	06

Q.2   a)   Using Westergaard's equation calculate stresses in Rigid pavement at corner edge, and at   07
interior from following given data:-
    i.   Wheel load   = 5100kg
    ii.   Modulus of elasticity of cement concrete $=3.0\times10^5$kg/cm^2
    iii.   Poisson's Ratio   = 0.15
    iv.   Thickness of slab   = 18cm
    v.   Modulus of subgrade reaction   k = 6.0kg/cm^3
    vi.   Radius of contract Area = 15cm

    b)   Explain the different types of joints in Rigid pavement with neat sketch.   06

Q.3   a)   Design a flexible pavement by AASHTO method from following given data.   08
    i.   Subgrade CBR   =3.0%
    ii.   ESAL   =3.8Million
    iii.   Reliability Needed =95%
    iv.   Standard deviation =3.0
    v.   Serviceability loss =25
    vi.   Base course CBR   =25%
    vii.   Drainage condition is good with saturation time more than 25% for all layer.

    b)   Explain Burmister's method of flexible pavement.   05

Q.4   a)   What is mechanistic method? Explain finite element method for design of flexible   07
pavement.
    b)   Explain different types of pavement along with its advantages and disadvantages.   06

Q.5   Write a short note on following.
    a)   Equivalent single wheel load.   05
    b)   Critical loading location.   05
    c)   Reliability.   04

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Section B

Q.6   a) Explain the term drainage coefficient and load terms for coefficient (J) used in AASHTO   06
rigid pavement design.

       b) Explain different temperature stresses in Rigid pavement.   07

Q.7   a) What is composite pavement? Explain it's merits and demerits.   06

       b) Explain French method of composite pavement design.   07

Q.8   a) Explain different steps involve in selection of pavement types recommended by TRB.   06

       b) Explain present worth method of economic analysis of highway.   07

Q.9   a) Explain the term "annual highway cost" & "road user cost" in detail.   07

       b) A cement concrete pavement has a thickness of 18cm and has two lanes of 7.2m with a   06
longitudinal joint along the centre. Design the dimensions and spacing of the tie bar using
following data:-

          1) Allowable working stress in steel $=1400 \text{kg/cm}^2$

          2) Coefficient of friction between slab & subgrade $=1.5$

          3) Unit weight of concrete $=2400 \text{kg/m}^3$

          4) Allowable working bond stress in steel $=24 \text{kg/cm}^2$

Q.10   Write a note on following.

       a) Life time cost Analysis.   04

       b) U.K. standards design for composite pavement.   05

       c) Pavement design submittals.   05

Total No. of Printed Pages:2

SUBJECT CODE NO: H-193
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (Civil)
Water Resource Engineering - I
(OLD)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
i. Question no. 1 and question no. 6 are compulsory.
ii. Attempt any two questions from remaining questions from each section.
iii. Figures to right indicate the maximum marks.
iv. Assume suitable data, if necessary

SECTION A

Q.1   Attempt any FIVE   10
  a) What is the importance of hydrology?
  b) What is precipitation? What are its different forms?
  c) Define evaporation and evaporation process.
  d) Define evapotranspiration and enlist the various factors which affect the evapotranspiration.
  e) What is rainfall simulator?
  f) What is hydrograph? Enlist various hydrographs used for runoff analysis.
  g) Define stream gauging.
  h) What are the objectives of flood frequency analysis?

Q.2   a) What are the practical applications of hydrology? Explain the hydrologic cycle with a neat   08
           sketch.
      b) A 7hr storm produced the following rainfall intensities(in mm/h)at half an hour intervals   07
           over a basin of area 1830 km^2:4,9,20,18,13,11,12,2,8,16,17,13,6 and 1. If the
           corresponding observed runoff is 40 million m^3, estimate the Φ-index for the storm.

Q.3   a) What is unit hydrograph? Discuss the uses and limitations of unit hydrograph.   06
      b) Using the ordinates of a 12-h unit hydrograph, determine the ordinates of 6-h unit   09
           hydrograph:

Time (h)	0	6	12	18	24	30	36	42	48	54	60
Ordinates of $12 - h\,UH$	0	60	140	190	230	210	180	140	90	30	0

Q.4   a) Give the various empirical formulae used for the estimation of peak flood discharges.   07
      b) Discuss the importance of evaporation control of reservoirs and possible methods of   08
           achieving the same.

Q.5   Write a short note on (any three)   15
  a) Rain – gauge network
  b) Infiltrometers
  c) Base flow separation
  d) Gumbel's distribution

1

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SECTION B

Q.6   Attempt <u>any five</u>   10

   a) Define with sketch cone of depression and drawdown.
   b) Define coefficient of transmissibility.
   c) Write down the discharge equation for confined and unconfined aquifer with its meaning.
   d) Enlist the different crops in India.
   e) Find the delta for a crop if the duty for a base period of 90 days is 1350 hectares / cumec.
   f) Define field capacity and permanent wilting point with neat sketch.
   g) Explain with neat sketch loose boulder structure.
   h) Define water logging and enlist the causes of water logging.

Q.7   a) What do you understand by recuperation test? Derive the equation used in the recuperation   07
          test.

   b) Calculate the discharge in m^3/ day from a tube well under the following conditions;   08

   i.   Diameter of the well = $45cm$
   ii.   Drawdown at the well = $12m$
   iii.   Length of strainer = $30m$
   iv.   Radius of influence of the well = $200m$
   v.   Coefficient of permeability = $0.01\ cm\ /\ sec$
   vi.   Aquifer type = unconfined

Q.8   a) Define irrigation. What are the functions of Irrigation water? Explain with neat sketch of   08
          layout of drip irrigation.

   b) The GCA for an irrigation canal is 30000 ha, out of which 55% is CCA. The intensity of   07
      irrigation is 40% for Rabi and 50% for Rice. If kor period is 3 weeks for Rabi and 2.5
      weeks for Rice, determine the outlet discharge. The duty of water on the field for Rabi and
      Rice may be assumed as 1500 hectares/cumec and 750 hectares / cumec. Also calculate
      delta for each case.

Q.9   a) Explain with neat sketches different watershed structures in drainage line treatment.   08

   b) How the drainage of irrigated areas is done for water logged areas.   07

Q.10   Write a short note on (<u>any three</u>)   15
   a) Different methods of ground water recharge
   b) Irrigation water standards
   c) Crop rotation and important crops in India.
   d) Storage coefficient and permeability.

Total No. of Printed Pages:02
SUBJECT CODE NO:- H-216
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Elective-II: Advanced Structures
(REVISED)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.
N.B   1) Solve any two questions from each section.
             2) Use of IS 456, non-programmable calculator is allowed.
             3) Assume suitable data if necessary & state it clearly.

Section A

Q.1   A building rests on six columns 500mm diameter & arranged as shown in fig.1. Each central   20
       column carried a load of 800 KN & the end column carry 500KN each. Design main beam ABC &
       secondary beam BE of the raft foundation. Considering total wind load moment of 1200 KN-m.
       SBC of soil is 75 KN/m^2 use M_{20} & Fe_{415}.
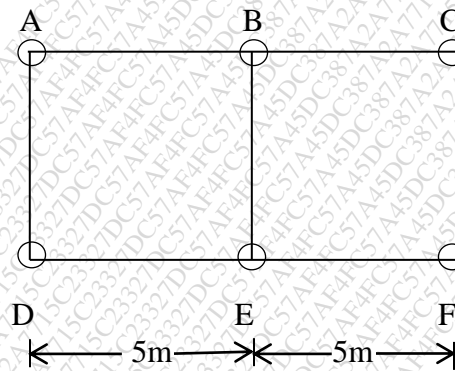
Fig.1

Q.2   A 600mm square column is supported on four piles of 250mm diameter each. The Centre of each   20
       pile is located at a distance of 0.5m from the central column. The column carries a service load of
       1000KN & moment of 75KN-m. There is a moment of 250KN-m due to wind acting in any
       direction at a time. Design the pile cap use M_{20} , Fe415.

Q.3   Design a beam for a circular hall of 5m radius supported on eight supports. The slab is carrying   20
       load of $5KN/m^2$ & floor finish at 1.5 KN/m^2. Beam is also subjected to a brick masonry load
       having 2.5m height. $K_1=0.066$, $K_2=0.033$, $K_3=0.005$, $\emptyset = 9.5°$. Show reinforcement details.

1

Section B

Q.4   a) Explain following terms with reference to bridges   12
   1) IRC loading
   2) Ground contact area
   3) Dispersion of load along span
   4) Distribution of wheel load on slab
    b) Derive the relation for edge shear in folded plates.   08

Q.5   a) Explain various types of transmission towers & their utility in load resistance   10
    b) Explain following terms   10
   1) Solidity ratio
   2) Guyed towers
   3) Lattice towers

Q.6   a) Explain design procedure of deep beam by IS code & British code.   10
    b) A beam 3500 mm deep & 250mm wide continuous over 3m spans & carries Udl. Service   10
   load of 160 KN/m & is supported on walls of 600mm thick on each end. Use M_{20}, Fe_{415}.
   Design deep beam.

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-166
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Fluid Mechanics - II
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
    i) Q.No.1 and Q.No.6 are compulsory.
    ii) Solve any two questions from each section.
    iii) Assume suitable data if necessary.

Section: A

Q.1   Attempt the following(any five)   10
    i.   Draw velocity distribution diagram in open channels.
    ii.   What is Hagen poiseulle's formula?
    iii.   What do you mean by economic channel sections?
    iv.   Define aerofoil and Magnus effect.
    v.   What do you mean by fundamental dimension?
    vi.   Define Critical Depth and Critical flow.
    vii.   What are standing Wave Flume and Venturiflume?
    viii.   Enlist the forces acting on immersed bodies in flowing fluids.
    ix.   Define Boundary Layer Theory.
    x.   If $v=2.1$ m/s, $Y_m=1.6$m, $S_0=1:1000$ find out chezy's constant C.

Q.2   a) Explain the most economical section of channel. In which situations, the rectangular   07
        channel section can become most economical? Derive the relations involved.
    b) A channel is to be designed to give a constant mean velocity of flow of 1.8m/sec. at all   08
        depth of flow. The lower portion of the channel to carry the minimum discharge is
        rectangular and the best proportion, the bottom width being 1.5m. Determine the depth of
        flow when width of water surface is 9m. If Manning's n=0.015, find the channel bed
        slope.

Q.3   a) Define the hydraulic jump and obtain an expression for depth of hydraulic jump.   07
    b) A rectangular channel 4m wide and bed slope of 0.0005 discharges $6m^3$/s. find the depth   08
        of water using manning formula and taking N=0.02.

Q.4   a) Derive an expression for displacement thickness.   07
    b) Derive an expression Drag force on a flat plate by momentum equation.   08

Q.5   a) Explain with neat sketch uniform flow and gradually varied flow.   05
    b) Describe the Rayleigh's method for dimensional analysis.   05
    c) Define :i) Subcritical flow ii) Supercritical flow   05

Section: B

Q.6   Attempt the following.(any five)   10
   i.   Draw velocity triangle for Kaplan turbine.
   ii.   What is impact of jets?
   iii.   What do you mean by impulse momentum question?
   iv.   Define radial flow reaction turbine.
   v.   What is reciprocating pump?
   vi.   Write functions of Surge tank?
   vii.   Draw neat diagram of Moody draft tube.
   viii. Enlist the dimensionless numbers.
   ix.   What is priming of pumps?
   x.   If diameter of a wheel pelton turbine is 1.7m and jet diameter is 12cm, find out the number of buckets.

Q.7   a) Derive an expression for the force exerted by jet of fluid on a moving flat plate when the   07
            plate is normal to the jet.
        b) A metal plate on of 10mm thickness and 200mm square is hung so that it can swing   08
            freely about the upper horizontal edge. A horizontal jet of water of 20mm diameter
            impinges with its axis perpendicular and 50mm below the edge of the hinge, and keeps it
            steadily inclined at 30° at the vertical. Find the velocity of the jet if the specific weight of
            the metal is 75KN/m^3.

Q.8   a) Explain with neat sketch the working of Pelton wheel.   07
        b) Determine the efficiency of a Kaplan turbine developing 4000HP under a net head of 5m.   08
            It is provided with a draft tube of 3m inlet diameter set 1.6m above the tail race level. A
            vacuum gauge connected to the draft tube inlet indicates a reading of 5 m of water.
            Assume draft tube efficiency 78%.

Q.9   a) What are the different problems and remedies for centrifugal pump?   07
        b) Obtain an expression for the work done by impeller of a centrifugal pump on water per   08
            second per unit weight of water.

Q.10   Write short notes on following.   15
   i)   Reciprocating pump.
   ii)   Effect of acceleration and frictional resistance.
   iii)   Slip and cavitations with reference to the reciprocating pump.

Total No. of Printed Pages:3

SUBJECT CODE NO:- H-167
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Fluid Mechanics – II
(OLD)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1. Q.No.1 and Q.No.6 are compulsory.
2. Solve any two questions from remaining questions from each section.
3. Assume suitable data, if any.

Section-A

Q.1   Solve any five from following.   10

    i)   Define Total Energy Line.
    ii)   Which formulae is used to find major energy losses.
    iii)   Define gradually and rapidly varied flow.
    iv)   Enlist the advantages of distorted model.
    v)   What do you mean by velocity defect?
    vi)   Define Euler's number.
    vii)   Give the conditions due to which laminar flow changes to turbulent flow.
    viii)   Define model and prototype.
    ix)   What do you mean by equivalent pipe?
    x)   Draw neat diagram of specific energy depth relationship.

Q.2   a) Obtain an expression for velocity distribution in terms of average velocity for   09
       i)   Smooth pipe
       ii)   Rough pipe

    b) A 20 cm diameter pipe reduces abruptly to 10cm diameter. If the pipe carries water at 40   06
    litres/ second, calculate the pressure loss across the contraction. Take the co-efficient of
    contraction as 0.6.

Q.3   a) Find an expression for loss of head for a hydraulic jump.   07

    b) The discharge of water through a rectangular channel of width 10.0m is $22m^3$/sec, when   08
    depth of flow of water is 1.5m. calculate
       i)   Specific energy of flowing water
       ii)   Critical depth and critical velocity

Q.4   a) How are repeating variables selected for dimensional analysis?   07

1

b) Define following:- 08
   i) Prototype
   ii) Model analysis
   iii) Hydraulic similitude
   iv) Kinematic similarity

Q.5   Write short notes on 15
   i) Siphon
   ii) Types of flow in open channel
   iii) Dimensional homogeneity

Section-B

Q.6   Solve any five 10
   i) What do you mean by negative slip of a reciprocating pump?

   ii) Define the term
      a) Impact of jet
      b) Jet propulsion

   iii) Define specific speed of turbine.
   iv) What are the functions of draft tubes?
   v) Draw main characteristic curves of a pump.
   vi) Enlist the advantages of air vessel
   vii) Define Manometric head.
   viii) Define Cavitation
   ix) Enlist various efficiencies of a turbine.
   x) Define tailrace and head race.

Q.7   a) Derive the relation for the force exerted by a jet of fluid on a moving flat plate when the plate 07
          in inclined to the jet.

       b) An inward flow reaction turbine has external and internal diameter as 1.0m and 0.6m 08
          respectively. The hydraulic efficiency of the turbine is 90% when the head of the turbine is
          36m. The velocity of flow at outlet is 2.5m/sec and discharge at outlet is radial. If the vane
          angle at outlet is 15^0 and width of the wheel is 100mm at inlet and outlet, determine:-
          i) The guide blade angle
          ii) Speed of the turbine
          iii) Vane angle of the runner at inlet
          iv) Volume flow rate of turbine
          v) Power developed

Q.8   a) Explain with neat sketch working of an inward flow reaction turbine. 07

       b) Obtain an expression for work done by the centrifugal pump on water. 08

2

Q.9   a)   Derive an expression for friction head in suction and delivery pipe of reciprocating pump.   07

b)   A single acting reciprocating pump are having length 5m & diameter 10cm of a suction pipe.   08
The pump has a plunger of diameter 15cm and a stroke length of 35cm. the centre of the
pump is 3m above the water surface in the pump. The atmospheric pressure head is 10.3m of
water and pump is running at 35 rpm. Determine:-
i)   Pressure head due to acceleration at the beginning of the function stroke
ii)   Maximum pressure head due to acceleration
iii)   Pressure head in the cylinder at the beginning and at the end of stroke

Q.10   Write short notes on:-   15
i)   Specific speed of turbine
ii)   Hydraulic lift
iii)   Hydraulic press

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-103
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (Civil)
Environmental Engineering - I
(OLD)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.
N.B
        1) Attempt any three questions from each section.
        2) Q.1 from section A & Q.6 from Section B are compulsory.
        3) Assume suitable data wherever necessary.
        4) Draw neat & labeled diagram whenever necessary.

Section- A

Q.1   a) Explain Primary & secondary air pollutant & describe in brief.   05
        b) Explain the effect of air pollution on   05
            a) Animal
            b) Vegetation
            c) Human.

Q.2   a) A factory uses 2.50000 litres of furnace oil (specific density is 0.97 / month). If for 1 million 08
            liter of oil used per year. The particulate matter emitted is 3.0 tonnes / year. SO_2 Emitted is
            59.7 tonnes/year, No_x emitted is 7.5 tonnes/year, hydrocarbons emitted are 0.37 tonnes / year
            & carbon monoxide emitted is 0.57 tonnes / year calculate the height of chimney required to
            be provided for safe dispersion of the pollutant.
        b) Enlist various equipment used for control of SPM. Draw neat sketch of any two.   07

Q.3   a) Write down air pollution law & ambient air quality standard.   08
        b) Explain the following atmospheric conditions   07
            (i)   Super adiabatic
            (ii)   Sub adiabatic
            (iii)   Neutral
            (iv)   Inversion

Q.4   a) Explain the plume behaviour of the gaseous effluent.   07
        b) Define wind rose. Explain the importance of wind roses in air pollution studies.   08

Q.5   Write short note on (any three).   15
        (a) Inversions
        (b) Dispersion model
        (c) Settling chamber
        (d) Acid rain
        (e) Atmospheric dispersion.

1

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Section-B

Q.6 a) Define & explain 'flowing through period' & 'detention period' in a sedimentation tank. 05
    b) Discuss various chemicals used for coagulation. 05

Q.7 a) Enlist different types of filters. Discuss in detail 'Rapid sand gravity filter'. 08
    b) Explain briefly the following process. 07
       (i)   Breakpoint chlorination
       (ii)   Super chlorination

Q.8 a) Enlist the different population forecasting methods. Explain any two in detail. 07
    b) Enlist & discuss minor methods of Disinfection. 08

Q.9 a) Find the settling velocity of discrete particles in water under condition when Re<0.5 the diameter and specific gravity of particle is 5×10^{-3} cm & 2.65 respectively. Water temperature is 20°C & kinematic viscosity of water at 20°C is 1.01×10^{-2} cm^2/sec. 07
    b) Discuss the physical, chemical & Biological characteristics of water. 08

Q.10 Write short note on (any three) 15
       (a) Aeration
       (b) Layout of water supply
       (c) Operational troubles in filters
       (d) Pressure filter
       (e) Coagulation

Total No. of Printed Pages:03

SUBJECT CODE NO:- H-322
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Strength of Materials
(OLD)

[Time: Three Hours]   [Max.Marks: 80]

Please check whether you have got the right question paper.

N.B   1) Q.1 & Q.6 are compulsory. Attempt any two questions from remaining from each Section.

Section A

Q.1   Attempt any five   10
   a) Enlist the elastic constants for an isotropic elastic material & relation between all.
   b) Determine the value of bulk modulus & modulus of rigidity, if stress=50 N/mm^2
      Strain = 0.003 & ratio of lateral strain to linear strain = 0.33.
   c) Draw stress strain curve for glass.
   d) Define neutral axis.
   e) Draw loading diagram for the case of pure bending.
   f) Draw shear stress distribution diagram for unsymmetrical I Section & angle Section.
   g) Calculate the value of equivalent load for uniformly varying load of intensity w kN/m.
   h) Define moment of resistance.
   i) What is the ratio of maximum shear stress to the average shear stress in case of solid circular section?

Q.2   a) Derive the relation between Young's modulus, modulus of rigidity & Poissions ratio.   08

        b) Derive the flexural formula for pure bending.   07

Q.3   a) Derive the relation between shear force, bending moment & load intensity.   03

        b) Draw loading diagram & bending moment diagram for given shear force diagram.   12

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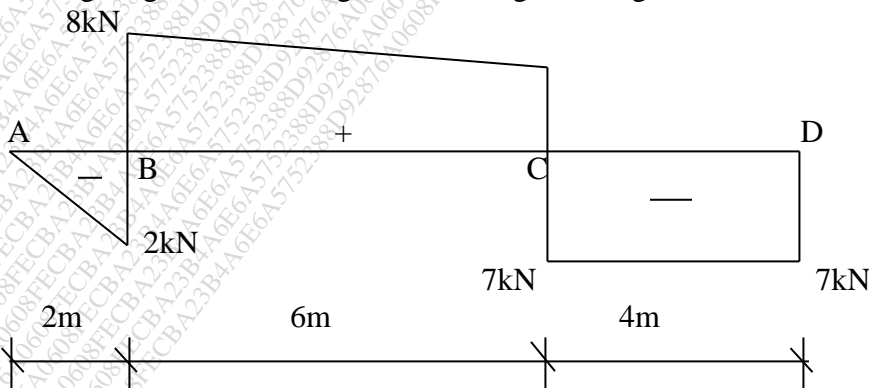
Q.4   a) At a room temperature (20℃) a 0.5 mm gap exists between the ends of the rod.   08
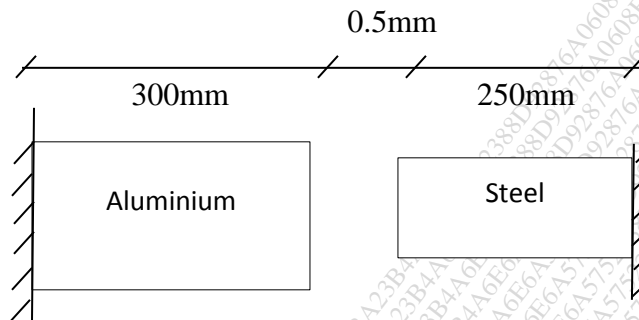
If temperature reached to 140℃. Find.
1) The normal stress in the aluminium rod.
2) Change in length of aluminium rod.

b) Derive $q = SA\bar{Y}/Ib$ 07

Q.5   A simply supported beam carries uniformly varying load from 125 kN/m at one end   &   15
250kN/m at the other end. Find the value of bending stresses (maximum) & value of shear
stresses for symmetrical I Section. Fiange $200mm \times 20mm$ web thickness. 20mm. overall
depth 300 mm.

Section B

Q.6   Attempt any five:-   10

a) Define i) Resilience   ii) Proof recilience.
b) What is torsional rigidity & Polar M.I.?
c) When a shaft is said to be subjected to pure torsion?
d) What do you mean by combined stress?
e) Define angle of obliquity.
f) Define impact load & gradually applied load.
g) Define Hoop Stress & longitudinal stress.
h) What is middle third rule?

Q.7   a) Consider the stepped bar made with a linear elastic material & subjected to an axial load 08
of 10 kN shown in fig. Find the value of strain energy for the bar.

2

A=100mm^2

E=200 GPa

400mm

E= 30 GPa

A=60mm^2

900mm

P=10 kN
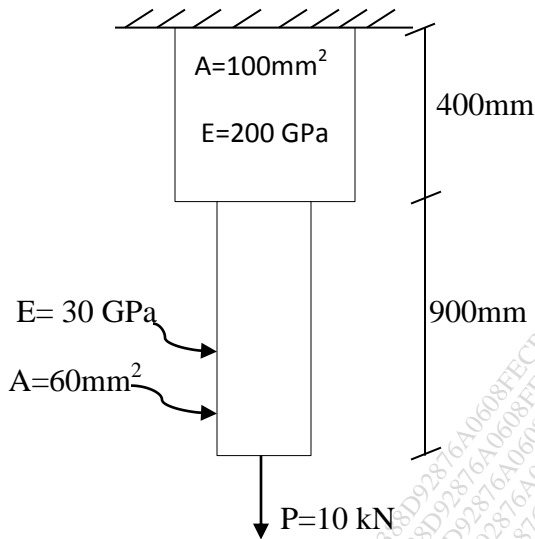
b) A vertical cylinder water tank is 80mm thick has diameter of 9m. Find the height upto which oil can be filled in the tank so that maximum stress in the tank is 50 MPa. Specific gravity of water is 1.　　07

Q.8　　a) What is slenderness ratio? What are the factor affecting the value of it.　　04

　　b) Define buckling load.　　01

　　c) A square chimney 20m high, has an opening of $1m \times 1m$ & wall thickness of 0.25m. Calculate the maximum & minimum value of stress on the section if it is subjected to wind pressure of 2250 N/m^2 take density of masonary 22.4 kN/m^3.　　10

Q.9　　a) Derive torsional formula.　　08

　　b) Derive the expression for crippling load for the column with both end fi fixed.　　07

Q.10　　a) Define
Major principle stress
Minor principle plane.　　03

　　b) At a point in a strained material the principal stresses are $100 N/mm^2$(tensile) & $40 N/mm^2$ (compressive). Determine normal stress, shear stress & resultant stress on a plane inclined at 55º to the axis of major principal stress. Also determine maximum shear stress at that point.　　12

3

Total No. of Printed Pages:05

SUBJECT CODE NO:- H-323
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Strength of Materials
(REVISED)

[Time: Three Hours] **[Max.Marks: 80]**

Please check whether you have got the right question paper.

N.B
1) Question No. 1 and 6 are compulsory. Attempt any two questions from remaining for each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data, if necessary.

Section A

Q.1   Answer the following. (any five)   10

    a) Define Elasticity.
    b) State Hooke's law.
    c) Explain Poission's ratio.
    d) Explain point of contraflexure.
    e) Define stress and types of stresses.
    f) Write flexure formula.
    g) Define modular ratio.
    h) Define volumatric strain.

Q.2   a) A member ABCD is subjected to point loads P_1, P_2, P_3 and P_4 as shown in fig. Calculate the force P_2 necessary for equilibrium if $P_1 = 10kN, P_3 = 40kN$ and $P_4 = 16\ kN$. Take $E = 2.05 * 10^5 N/mm^2$. Determine total elongation of the member.   07
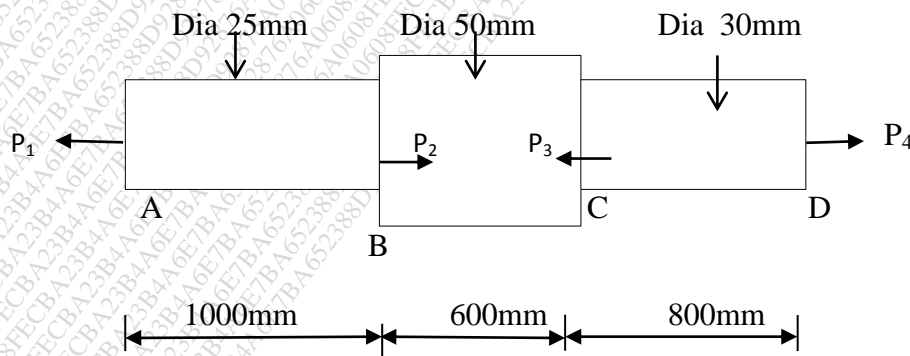
    b) A load of 400 kN is applied on a short column $300mm \times 300mm$. The column is reinforced by steel bars of 25 mm diameter and 4 NOS. if the modulus of elasticity for steel is 15 times that of concrete, find the stresses in concrete and steel.   08

1

Q.3   a) Define types of beam.   03

        b) Draw shear force and bending moment diagram for simply supported beam shown in   12
          fig.
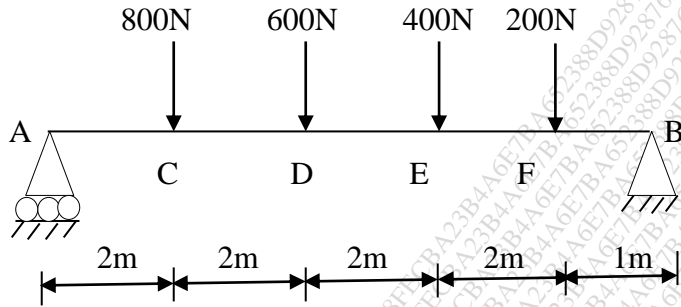
Q.4   'T' section with Flange $200mm \times 20mm$ and web $20mm \times 180mm$ is used as a cantilever 15
beam of 2.5m span subjected to u.d.L of intensity 20KN/m over its full span. Determine the
maximum stresses in the beam.
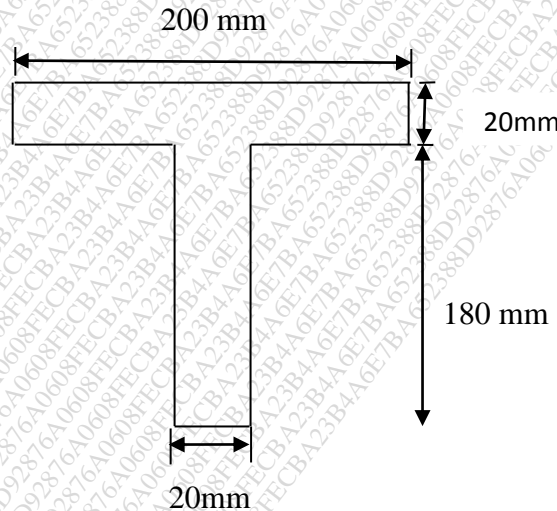
Q.5   a) Forces acting on piece of material as shown in fig. Find change in each dimensions and 08
        change in volume of material. Take E $= 2*10^5 N/mm^2$. $\mu = 0.25$

2

150kN

40mm

100kN

30mm

60mm

180kN
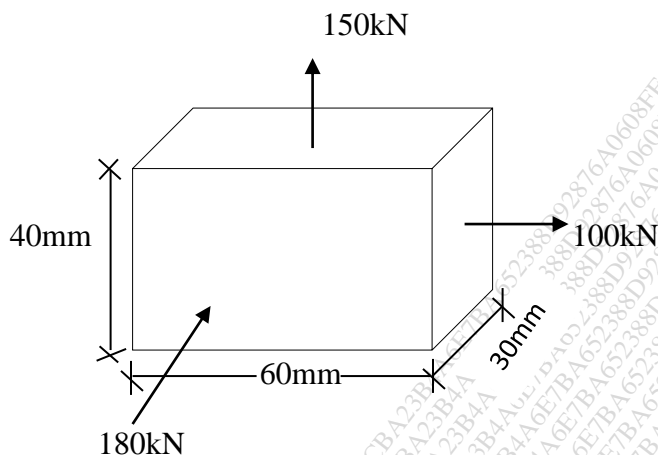
b) A steel beam of I section as shown in fig. is subjected to a shear force of 400 kN. Determine shear stress distribution for the beam Section.   07

200mm

25 mm

450 mm

25 mm

200 mm
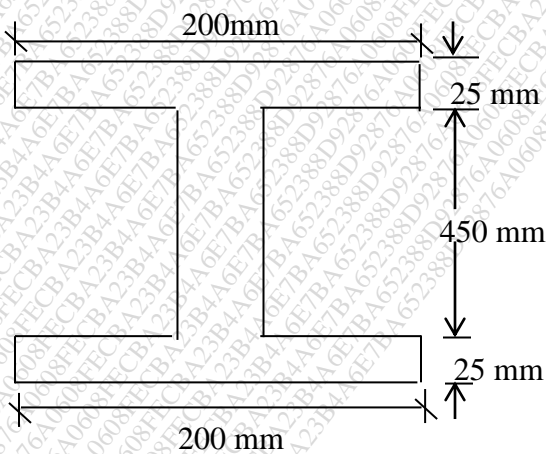
Section B

Q.6   Answer the following. (any five)   10

a) Define strain energy.
b) Explain core or Kernel of Section.
c) What are the assumptions in Euler's theory?
d) Define principle stresses and strain.
e) What are the assumptions in theory of torsion?
f) Define Limit of eccentricity.
g) Write torsional formula.
h) Enlist types of stresses in thin cylindrical shell.

3

Q.7   a) A shaft has to transmit 105 kw at 160 RPM. If the shear stress is not to exceed   08
$65N/mm^2$ and the twist in a length of 3.50m must not exceeds 1°, find a suitable
diameter. Take $C = 8 \times 10^4 N/mm^2$.

         b) A bar 50mm diameter, 2m long is fixed at upper end and provided with a collar at   07
lower end. A weight of 450 N is dropped on the collar from the height of 250mm.
Take E=200GPa.
Find:- i) The instantaneous stress
       ii) The instantaneous elongation
       iii) The strain energy stored in bar.

Q.8   a) A cylindrical shell 3m long which is closed at the ends has an internal diameter of 1m   08
and wall thickness of 15mm. Calculate the circumferential and longitudinal stresses
induced and also change in dimensions of the shell, if it is subjected to an internal
pressure 1.5 N/mm^2. Take $E = 2 * 10^5 N/mm^2$
$$\mu = 0.3$$

         b) A rectangular column $300mm \times 200mm$ is subjected to a compressive load of 450kN 07
at point P as shown in figure. Find the intensities of stress at all the four corners of
column.
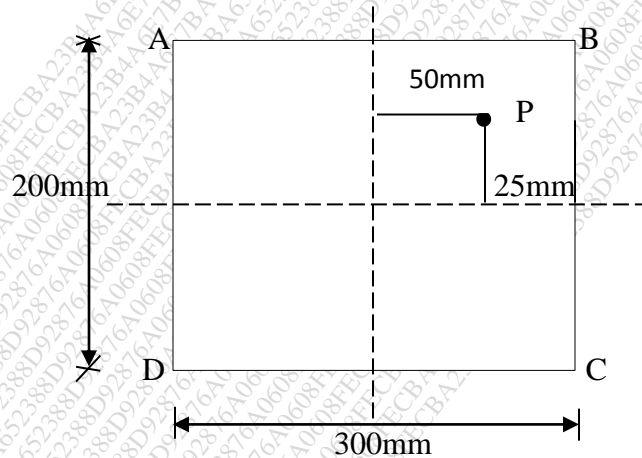
Q.9   At a point in a strain material there are two mutually perpendicular stresses of $20N/mm^2$ and 15
$10 N/mm^2$ both tensile. They are accompanied by shear stress of $10 N/mm^2$. Find
    i) Principle stresses
    j) Position of principle plane
    k) Maximum shear stresses

4

$$10N/mm^2$$
$$10N/mm^2$$
$$20N/mm^2$$
$$20N/mm^2$$
$$10N/mm^2$$
$$10N/mm^2$$
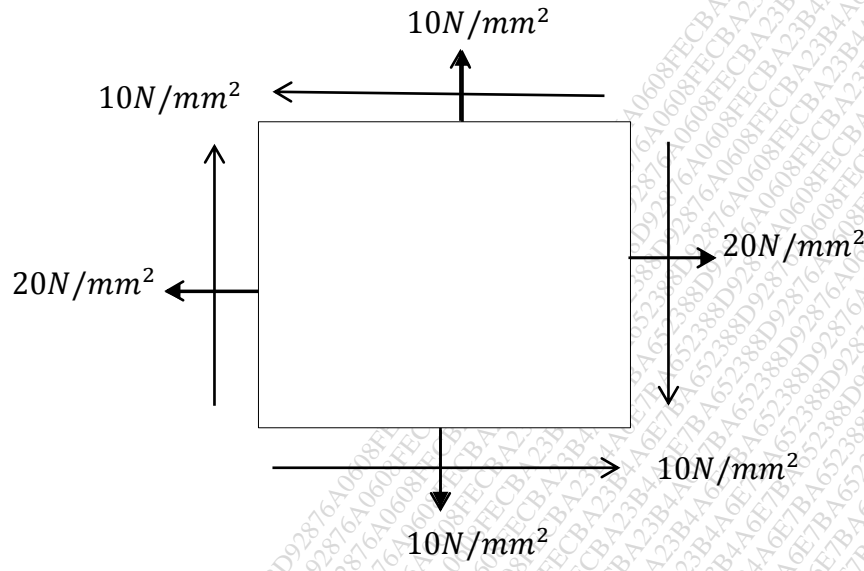
Q.10   A T-Section Column of mild steel 3.5m long with both ends fixed is shown in fig. Find the   15
safe axial load on the column.

Take $\sigma_e = 335 \ N/mm^2$ and $\alpha = \frac{1}{7500}$ and factor of safety of 3.

180 mm

15 mm

235 mm

10mm

5
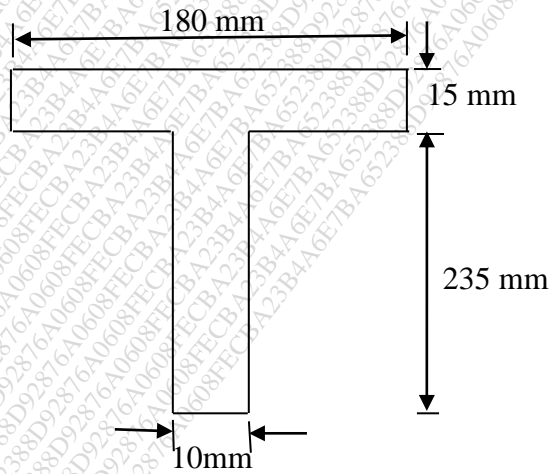
Total No. of Printed Pages:02

SUBJECT CODE NO:- H-314
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (Civil)
Engineering Geology
(OLD)

[Time: Three Hours]   [Max. Marks:80]

Please check whether you have got the right question paper.

N.B   i) Q.1 is compulsory & solve any two from the remaining question from section A.
                ii) Q.6 is compulsory & solve any two from the reaming question from section 'B'.
                iii) Neat diagram must be drawn whenever necessary.

Section A

Q.1   Write short notes (any five)   10
        a) Classification of Igneous Rocks.
        b) S-wave
        c) Unsymmetrical fold.
        d) Dyke & sill
        e) Inliners and outliners
        f) Dip and strike.
        g) Seismogram.

Q.2   A) What is fold ? Explain in details types of fold.   07

        B) What is unconformity? Explain in details types of unconformity in details.   08

Q.3   A) Short Notes on: 07
            I.   Compact basalt
            II. Archaeans & Dharwurs.

        B) What is volcanoes? Explain in details types of volcanoes.   08

Q.4   A) Short Notes on: 07
            I.   Meander
            II. Rejuvenation of River.

        B) Explain in details Geological work of river.   08

Q.5   A) Write an essay on standard Geological Time scale.   07

        B) What are the causes of earthquake ? Define the term Epicenter & Isoseismal line 08

1

Section B

Q.6 Write short Note on(any five) 10
    a) Basalt as road metal
    b) Porosity
    c) Over break
    d) Artesion well
    e) Confine aquifers
    f) Water tightness of basalt.
    g) Tunnel lining.

Q.7 A) Discuss the factors that help in selecting the rocks for building purpose. 07

    B) What is drilling ? What are types of drilling? What precautions are to be taken during the drilling. 08

Q.8 A) Discuss the geological factors such as fold zone inclined strata which effect the tunneling. 07

    B) Give the field characters of Amygdaloidal basalt and vesicular basalt. 08

Q.9 A) Describe the problems that are met in construction dams on compact basalt, lime stone. 07

    B) Explain in details preliminary geological investigation for selecting dam site 08

Q.10 A) What is Landslides? Explain in details the various method of prevention of landslides. 07

    B) What types of exploration is carried out at tunnel site. 08

2

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-303
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Environmental Engineering-II
(REVISED)

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1. Question No.1 and Question No.6 are compulsory.
2. Solve any two questions from each section.
3. Figure to right indicate full marks.
4. Assume suitable data and mention it clearly.

Section A

Q.1 Attempt any five 10
   a) Define
      i) Combined sewer
      ii) Separate sewer
   b) Estimate the sewage quantity to design separate sewage system serving population of 60,000 with rate of water supply of 135 lpcd.
   c) What is sludge buckling?
   d) What is mean by unit operation and unit process?
   e) Define BOD.
   f) What is non-scouring velocity?

Q.2 a) Explain the classification of water carriage system. 07
   b) Determine design discharge for combined system serving population of 60,000 with the 08
   rate of water supply of 150 lpcd. The catchment area is 100 hector and avg. coefficient of run-off is 0.60. the time of concentration for the design rainfall is 30 min and relation between intensity of rainfall and duration is

$$I = \frac{1000}{(t + 20)}$$

Q.3 a) What is self-purification? What are the various factors which affect the process of self- 07
   purification?
   b) State where manholes used in sewerage system? Explain working with neat sketch. 08

Q.4 a) A grit chamber is designed to remove particle with diameter of 0.2 mm. specific gravity 08
   2.65 for avg. working temperature20℃. A flow through velocity 0.25 m/sec. will maintain by providing a proportional flow weir. Determine the channel dimension for maximum waste water flow of 12000 m^3/day.
   b) What are various constituents of waste water? Write respective unit processes for 07
   removal of it.

1

H-303

Q.5   Write short note (any three)   15
      a) Forces of sewer
      b) Screening of waste water
      c) Slamming tank
      d) Sludge thickening

Section B

Q.6   Draw a flow diagram of waste water treatment with theirs functions (each unit)   10

Q.7   a) Determine the surface area of settling tank for 0.5 m^3/sec design flow using design   08
        overflow rate as 32.5 m^3/m^2/day. Find the depth of clarifier for the overflow rate and
        detention time of 95 min. adopt L/B between 2:1 and 5:1, length $\not>$ 100m.
      b) Explain "Bacteria-algae" symbiosis in oxidation pond.   07

Q.8   a) Explain with flow diagram, the essentials of activated sludge process.   07
      b) Determine the dimensions of high rate trickling filter for the following data.   08
        a) Sewage flow = 3 mld
        b) Recirculation ratio = 1.5
        c) BOD of raw sewage = 250 mg/lit
        d) BOD removed in primary tank = 25 %
        e) Final effluent BOD desired = 30 mg/lit.
        By what % the diameter of the filter will have to be modified of it is to be designed as
        standard rate trickling filter.

Q.9   a) What are the principles of UASBR and write its advantages and disadvantages.   07
      b) What is solid waste? Explain solid waste disposal method in details.   08

Q.10   Write short note (any three)   15
      a) Aerated lagoons
      b) Sludge digestion
      c) Rotating biological contractor
      d) Incineration
      e) Operating problems in trickling filter

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Total No. of Printed Pages:03

SUBJECT CODE NO:- H-293
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (Civil)
Design of Structure - I (Steel)
(OLD)

[Time: Three Hours]   **[Max. Marks: 80]**

Please check whether you have got the right question paper.

N.B   i) Solve <u>any *two*</u> questions from question no. 2 to 5 and any *two* question no.7 to 10.
                       ii) Q.No.1 and Q.No.6 are compulsory.
                       iii) assume suitable data wherever necessary and mention it clearly
                       iv) use IS 800:2007 , steel table and non-programmable calculator is allowed
                       iv)figures to the right indicate maximum marks

SECTION A

Q.1   Answer the following questions (any five):   10
       a) What are classifications of bolt?
       b) Write the advantages of limit state method?
       c) What are the disadvantages of welded connection?
       d) Explain gusseted base?
       e) What is shear lag?
       f) Explain failure of bolted joint?
       g) Which types of structural properties of steel use for design?
       h) Write down different IS codes provision for Nuts, Bolts & Washers?

Q.2   a. A single equal angle $150 \times 150 \times 10$ mm is connected to a 12mm thick guesset plate at the   15
           ends with 5 nos. of 20mm dia. Bolts to transfer tension. Determine the working tensile
           strength of the angle if factor of safety is 1.5. use the ultimate & yield strength of steel are 400
           & 240 MPa
           [take, e=40mm   &   p=60mm]

Q.3   a. Write down step by step procedure of welded connections?   05
       b. Design connections for members of roof truss, with gusset plate 12 mm thk, as shown in the   10
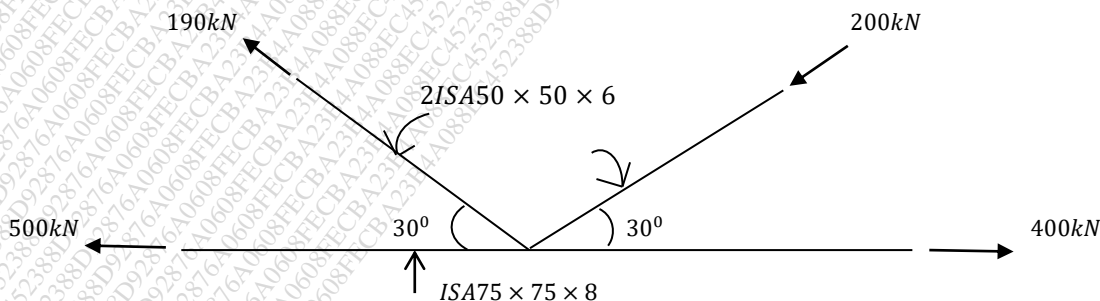   fig1.using 16mm dia. Bolt of grade 4.6

Fig. 1

1

H-293

Q.4　a.　Explain beam-column connection?　08
　　　b.　A compression member is made up of ISBH 300@577 N/m, if length of column is 3m long　07
　　　　and has pinned at both ends. Determine the maximum load carrying capacity?
　　　　[$use,\ fy = 240MPa\ \&\ fu = 410MPa$]

Q.5　a.　Write short notes on (Any three)　15
　　　　i.　　Comparison in between concrete and steel structures
　　　　ii.　 Explain limit state method.
　　　　iii.　Classification of cross sections of steel structures
　　　　iv.　Explain laced column & battened columns

SECTION B

Q.6　a.　Answer the following questions (Any five)　10

　　　　i.　　How laterally unsupported beam differs from laterally supported beam?
　　　　ii.　 Explain bearing stiffeners in plate girder?
　　　　iii.　How pitch and spacing is decided for a truss?
　　　　iv.　 State the components of a plate girder?
　　　　v.　　Explain bracing system?
　　　　vi.　 Explain local buckling of flanges?
　　　　vii.　What is the gantry girder?

Q.7　a.　A plate girder is simply supported over an effective span of 20m. It carries a udl of $20KN/m$　15
　　　　in addition to its self weight and two point load of 100KN each at 10m from their supports. It
　　　　is fully restrained at both ends against lateral buckling throughout the span. Take
　　　　$fy = 250MPa.\ design\ welded\ plate\ girder$

Q.8　a.　Explain the design procedure of laterally unsupported beam　05
　　　　b.　A simply supported beam has span of 10m laterally supported and it carries　10
　　　　$a\ udl\ of\ 40kN/m$ and point load $50kN$ at its center. Design the cross section and check for
　　　　Shear & deflection

Q.9　a.　A $40kN$ hand-operated crane is provided and has following data:　15

　　　　i.　　Centre to centre distance of the gantry beam=15m
　　　　ii.　 Span of gantry=6.0m
　　　　iii.　Weight of the crane=40KN
　　　　iv.　 Spacing of wheel=3m
　　　　v.　　Weight of the crab=10kN
　　　　vi.　 Minimum hook approach=1m
　　　　　　Design a simply supported gantry girder assuming lateral support to it

2

Q.10   a.   Write short notes on (any three)   15

         i.   Draw a neat sketch of pratt truss showing all its components
         ii.   Explain in detail wind load on trusses
         iii.   Differentiate between slab base and gusseted base
         iv.   Draw the sketches of various trusses and state suitability for spans

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-265
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (Civil)
Transportation Engg.- II
(OLD)

[Time: Three Hours]   [Max. Marks: 80]

Please check whether you have got the right question paper.
N.B   i)figures to the right indicate full marks
             ii) Question no.1 and 6 are compulsory.
             iii) Solve any two questions from remaining of each section.

Section A

Q.1   Explain briefly the modified classification of road system in India as per the third twenty year   10
        road development plan ,1981-2001.

Q.2   a) What is super elevation? Derive an expression for super elevation.   07

        b) Explain different types of failures in rigid pavements with neat sketch   08

Q.3   The speed of overtaking and overtaken vehicles are 86kmph and 70kmph, respectively on a two   15
        way road .if the acceleration of overtaking vehicle is 0.99 m/sec^2.
             i)   Calculate safe overtaking sight distance
             ii)   Minimum length of overtaking zone.
             iii)   Draw a neat sketch of the overtaking zone showing positions of sign post.

Q.4   a) Enlist different tests carried out on aggregates. Explain any one in detail   07

        b) What are various types of surveys carried out while designing highways   08

Q.5   a) Discuss vision 2021. And it's recommendations in detail   07

        b) Explain the total reaction time of driver and the factors on which it depends.   08

Section B

Q.6   Draw a sketch of flexibly pavement cross section and show component parts. Explain the function 10
        and importance of each component of pavement.

Q.7   a) State the functional classes of traffic signs with example.   07

        b) List various excavating machinery used during Highway construction . mention the uses   08
            and limitations of any two

1

H-265

Q.8	a)	Calculate the equivalent radius of resisting section of 20cm slab . given the radius of contact area of wheel is 15 cm.	07
	b)	Discuss the general causes of pavement failure.	08
Q.9	a)	Discuss briefly the importance of highway maintenance.	07
	b)	Differentiate between flexible and Rigid pavements.	08
Q.10		Explain group Index method of Pavement design. What are the limitations of this method	15

2

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Total No. of Printed Pages:5

SUBJECT CODE NO: H-273
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Theory of Structure-I
(REVISED)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
  i.   Q.no 1 and Q.no 6 are compulsory.
  ii. Attempt any two questions from remaining question from each section.
  iii. Assume suitable data wherever necessary.

Section A

Q.1   Attempt any five   10
       1. State castigliaon's theorem.
       2. What are the different types of welded connections?
       3. Write down fixed end moment for a fixed beam with a point load at the center of the span.
       4. Define determinate and indeterminate structures.
       5. Define rivet value and pitch.
       6. What are the disadvantages of welded connection?
       7. Give the strength of rivet in bearing and tearing.

Q.2   a) Find the size of fillet weld required to connect the backed plate to the column as shown in   07
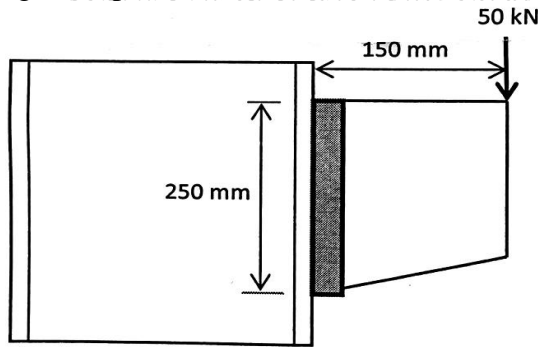   below fig.1 the permissible stresses in weld is 110 N/mm^2.

Fig.(1)

       b) Find the maximum resistance offered by any rivet for the riveted connection as shown   08
           in fig.2
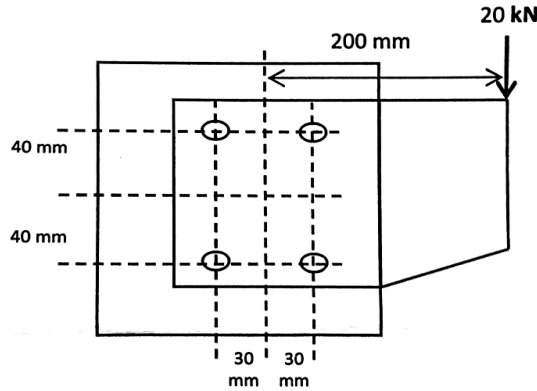
1

20 kN
200 mm
40 mm
40 mm
30 mm 30 mm

Fig. (2)

Q.3   A beam of length 7m is simply supported atit's ends as shown in fig.3. Determine the position and   15
magnitude of the maximum deflection. Using Maculays method.
Take $E = 200\ GPa$ and $I = 8500 \times 10^4 mm^4$.

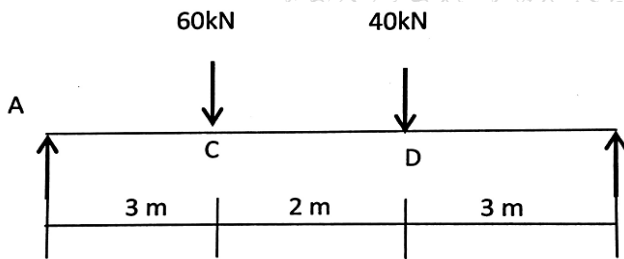60kN   40kN

A   B
C
D

3 m   2 m   3 m

Fig .3

Q.4   Find vertical and horizontal deflection of joint C of the truss shown in fig 4. The area of inclined tie   15
is 2000 mm^2, while the area of horizontal member is $1600mm^2$. Take$E = 200\ kN/mm^2$.

A
3 m
θ
B   4 m
120 kN

Fig. 4

2
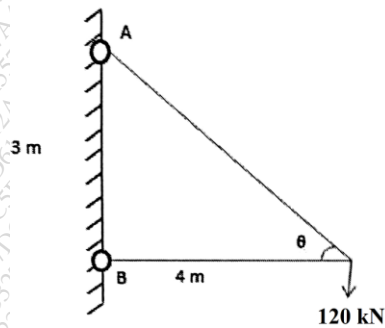
Q.5   Determine fixed end moment for the loaded beam as shown in fig.5 also draw BMD and SFD for   15
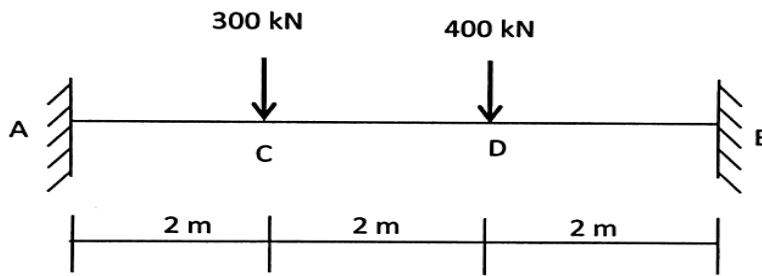beam.

Fig.5

Section B

Q.6   Attempt <u>any five</u>   10

1. Define radial shear and normal thrust.
2. What is clapeyron's theorem for three moments?
3. What are the stiffening girders?
4. What are the uses of influence lines?
5. A three hinged parabolic arch of span 30m and central rise of 5m is loaded with point load of 12kN at 12m from left end. Calculate horizontal and normal thrust of the arch.
6. What are rolling loads?
7. What are the advantages of three hinged arches?

Q.7   Analyse the continuous beam as shown in figure 6. Find the moments along the beam and support   15
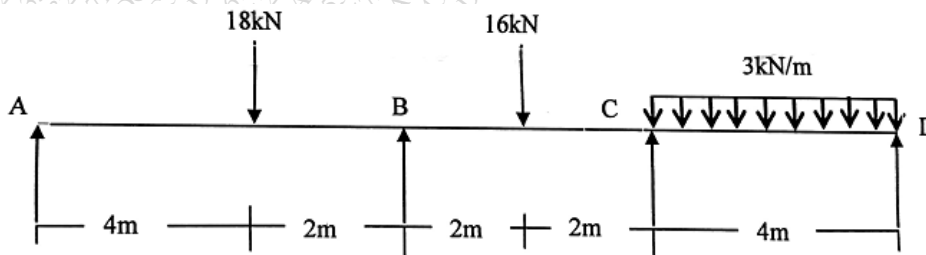reactions. Also draw BMD.

Fig.6

3

57A45DC387A2A7715C23327DC5D612A5

Q.8   A train of 5 wheel loads as shown in figure 7. Crosses a simply supported beam of span 24.5m.   15
Calculate maximum positive and negative shear force values at center of span and absolute
maximum B.M. anywhere in span.

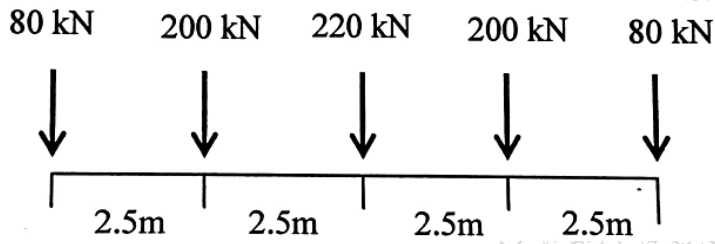| 80 kN | 200 kN | 220 kN | 200 kN | 80 kN |

| | 2.5m | 2.5m | 2.5m | 2.5m | |

Fig.7

Q.9   Three hinged arch of span 30m and rise 6m carries a UDL of intensity 40kN/m over the left half   15
span. Determine support reactions, horizontal thrust, normal thrust and radial shear force at left
quarter.

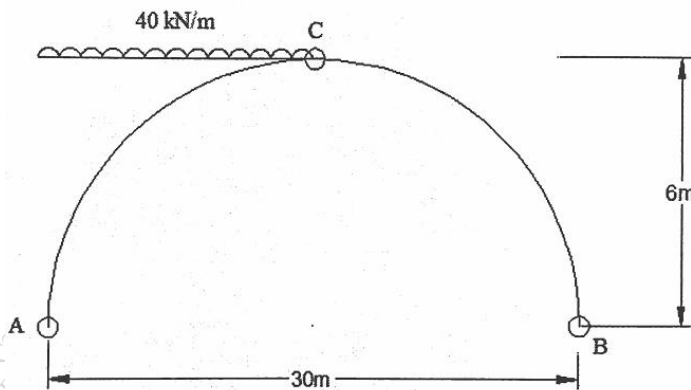
40 kN/m

6m

A

C

B

30m

Fig.8

Q.10 A cable of a suspension bridge has a span of 500m over supports, which are at same level and sag of 15
40m vertically from line of support to lowest point on cable at mid – span. The three hinged
stiffening girders carries 3 loads of 350kN, 450kN and 500kN at 60m, 140m and 300m respectively
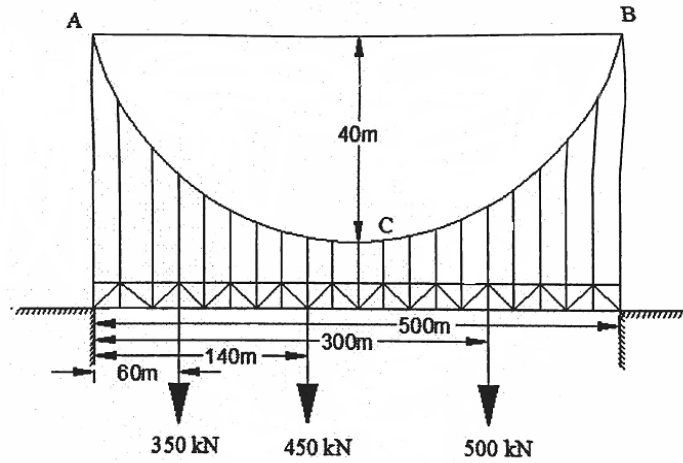from left end support. Draw bending moment diagram for the girder.

Fig.9

Total No. of Printed Pages:03

SUBJECT CODE NO: H-274
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Theory of Structure-I
(OLD)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
    i.   Attempt <u>any three</u> questions <u>from each section</u>.
    ii.   Figures to right indicate the maximum marks.
   iii. Non – programmable calculator is allowed.
   iv. Assume suitable data, if any.

Section A

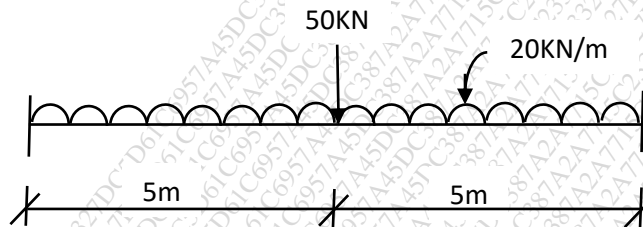Q.1   Draw the SFD & BMD for the fixed beam as shown in figure 1.   13

Figure No.1

Q.2   A beam of length 05m is simply supported at its ends as shown in following figure 2. Determine   13
the deflection of the beam at point 'C' and also the position of maximum deflection.
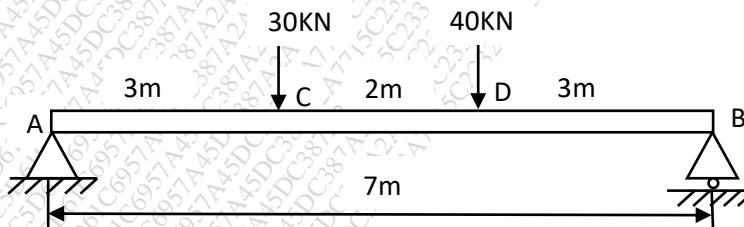Take $E = 200 \times 10^3 N /mm^2$ and $I = 4.0 \times 10^8 mm^4$.

Figure No.2

Q.3   Find the vertical and horizontal deflection of joint D of the truss as shown in following fig.03   13
If, Area of top chord $= 1200mm^2$
Area of bottom chord $= 1750mm^2$
Area of remaining member $= 600mm^2$
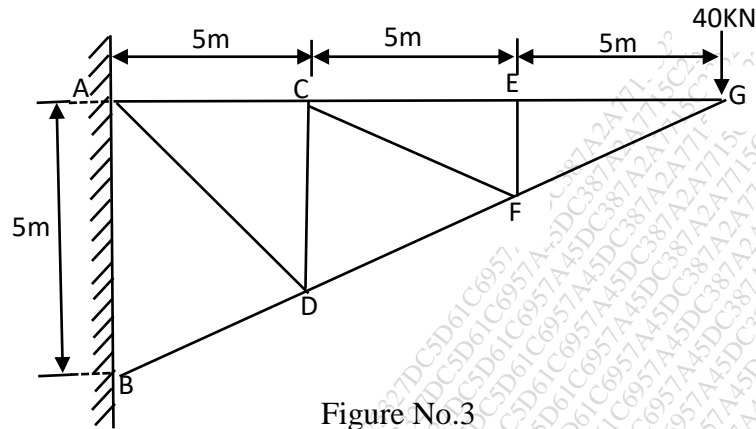$E = 200\ KN/mm^2$

1

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Figure No.3

Q.4   a) Explain difference in between riveted and welded connections?   05

b) Find the size of the fillet weld required to connect the back d plate to the column as shown 08
in fig.04. The permissible stress in weld is $150\ N/mm^2$
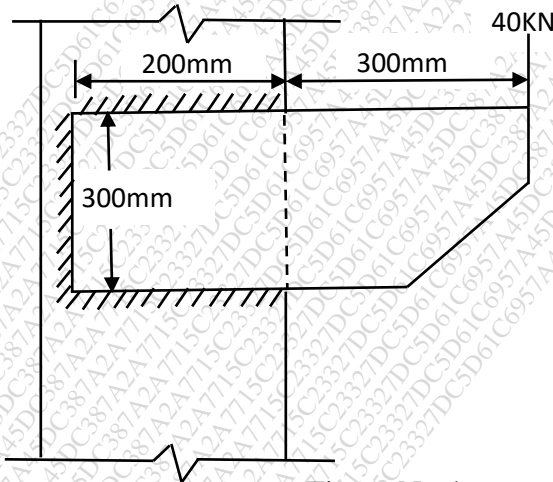
Figure No.4

Q.5   Write a short notes on (Any four)

a) Advantages and dis – advantages of welded connections.   04
b) Fixed ends moments of fixed beams subjects to   04
    i)   Point load
    ii)   udl
    iii)   Moment at center
c) Sinking of supports.   03
d) Criteria for constructing conjugated beam.   03
e) Difference in between fixed and simply supported beam.   03

2

Section B

Q.6   Draw BMD of fixed beam as shown in figure 5 by using three moment theorem.   13

50KN/m

A   B
|←————————— 5m —————————→|

Figure No.5

Q.7   A train of a wheel load as shown in fig.6 crosses a simply supported beam of span 40m from left   13
to right with point loading. Using influence line diagram, determine the maximum bending
moment under central load.
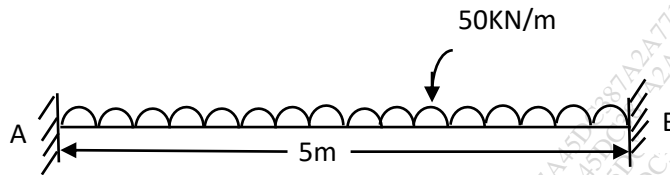
30KN   30KN   30KN   40KN   40KN

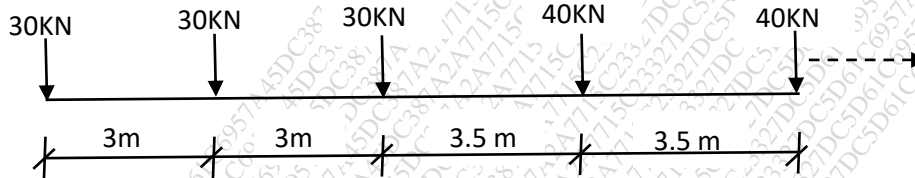|←— 3m —→|←— 3m —→|←— 3.5 m —→|←— 3.5 m —→|

Figure No.6

Q.8   A three hinged parabolic arch of span 30m and central rise of 5m carry UDL of 50 kN/m over the   13
left half span and a two point loads of 125kN and 125kN at 8m and 16m respectively from left
support. Find normal thrust, radial shear, & BM at distance of 6m from left support.

Q.9   For a cable suspension bridge with pan 450m & central dip of 45m, which is stiffened by three   13
hinged stiffening girder? The girder carves two point load of 50kN and 75kN at distance of 70m
& 250m form left support. Draw the bending moment diagram.

Q.10   Write a short notes on (any four)

       a) Rolling loads   04
       b) Influence line diagram   04
       c) Difference between fixed beam and continuous beam.   03
       d) Types of stiffening girders   03
       e) Advantages of arch beam.   03

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-181
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Professional Practice
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
(i) Q.No.1 is compulsory and solves any two questions from remaining in section 'A'.
(ii) Attempt any three questions from Section 'B'.
(iii) Figures to right indicate the maximum marks.
(iv) Assume suitable data if necessary.

Section A

Q.1   Workout the quantities of the following items from the given drawing (fig.1)   20
(a) Excavation in murum for foundation
(b) P.C.C. bed
(c) U.C.R. Masonry in cm (1:6) in foundations
(d) Brick Masonry without deductions.
(e) Inside cement plaster in CM 1:2 with neeru finishing without deductions.

PLAN

FOUNDATION DETAILS
(Fig.1)

1
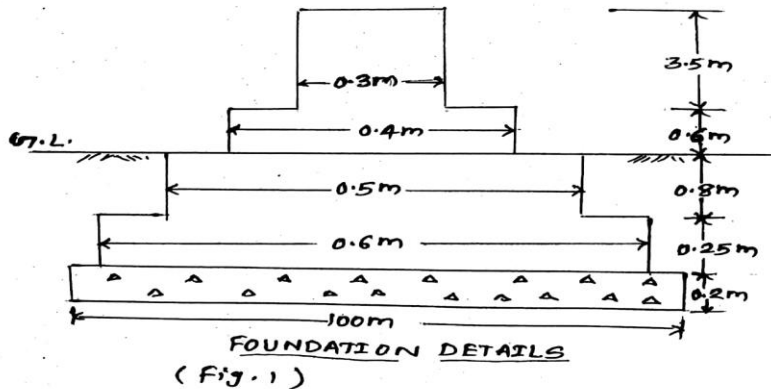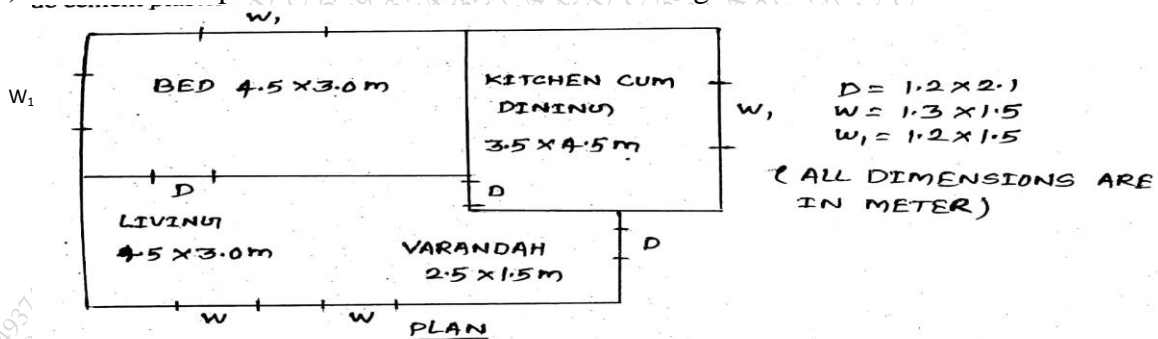
Q.2   Write detailed specification for:
       (a) Foundation trench excavation work   05
       (b) Pipeline laying work.   05

Q.3   Carry out rate analysis for:
       (a) Class-II Brickwork in C.M. (1:6)   05
       (b) 12cm thick R.C.C. slab (1:2:4)   05

Q.4   Explain the following:
       (a) Approximate estimate of building   04
       (b) Prime cost   02
       (c) Features of P.W.D. method of taking out quantities.   04

Section B

Q.5   Explain the following in details
       (a) Essentials of valid contracts   02
       (b) Sinking funds   04
       (c) Labours contracts.   04
       (d) E.M.D. and S.D.   04

Q.6   (a) Distinguish clearly between negotiated contracts and item rate contracts   07
       (b) Explain the several ways by which the contract can be terminated.   06

Q.7   (a) What is valuation? Explain its purpose   07
       (b) Explain administrative approval and technical sanctions.   06

Q.8   (a) Explain procedure for preparation and submission of tender for construction work   07
       (b) What is muster roll? What are the rules to be observed in its preparation?   06

Q.9   (a) Write short note on Housing loans, EMI and Repayment conditions   07
       (b) What is a sale deed? Discuss its concept and use.   06

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-348
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (Civil)
Building Planning & Design
(OLD)

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1. Question no.1 and question no.6 are compulsory.
2. Solve any two questions from question no.2 to 5 and any one from question no. 7 to 8.
3. Figures to right indicate the maximum marks.

Section A

Q.1 Attempt any five 10
   a) Define proportion and Rhythm.
   b) Define roominess and flexibility and give the examples.
   c) Define set back line.
   d) Define single stack system and one pipe system.
   e) What are the standard dimensions of garage, kitchen room, bath separate, and children's bed?
   f) Draw a neat sketch of 'P' trap and 'S' trap with their water seal values.
   g) Define septic tank what is the capacity of single and double compartment house-hold septic tank.

Q.2 a) Enlist the different principles of building planning and explain any two in detail. 08
   b) Define orientation. What are the suggestions made by CBRI for obtaining optimum orientation? 07

Q.3 a) Explain the byelaws regarding requirement for off street parking. 08
   b) Enlist the different types of residential buildings explain any two in detail with neat sketch. 07

Q.4 a) What are the different types of water supply fittings? 08
   b) Explain testing of drains and maintenance of drains. 07

Q.5 a) Write a short note on unity and contrast. 07
   b) Explain in detail factors affecting the selection of site for residential building. 08

1

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Section B

Q.6   Plan and design a residential bungalow for a family in new Aurangabad town using following data:
   a) Plot size $9m \times 12m$
   b) Scale 1:50
   c) Plinth height 0.6 m
   d) Required components: Ent. Verandah, living room, bedroom, master bed, separate W.C.,
      bath, kitchenroom, store room & stair case-doglegged.
      Draw :
      a) Working plan   05
      b) Locate the position of columns in plan   03
      c) Elevation   04
      d) Section through staircase   06
      e) Schedule of opening   03
      f) Area statement (block plan calculations)   04

Q.7   By consuming suitable data and standard norms list out the requirements and draw a line plan of   15
       primary health center for a rural area.

Q.8   a) Explain the following terms in perspective drawing with neat sketch: center of vision, picture 08
          plane, station point and vanishing point.
       b) Define landscaping. What is the necessity of landscaping? Explain the objectives of   07
          landscaping?

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-349
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (Mechanical)
Fluid Mechanics
(OLD)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.
N.B
      i) Attempt any three questions from each Section.
      ii) Assume suitable data, if necessary.
      iii) Draw a neat labelled sketch wherever necessary.

SECTION – A

Q.1   a) State and derive Pascal's law. Give one real life application of Pascal's law.   06

        b) Two large plane surfaces are 2.4 cm apart. The space between the surfaces is filled with   07
            glycerine. What force is required to drag a very thin plate of surface area $0.5\ m^2$ between the
            two large plane surfaces at a speed of 0.6 m/s if;
            1) The thin plate is in the middle of the two plane surfaces and
            2) The thin plate is at a distance of 0.8 cm from one of the plane surfaces? Take the
               dynamic viscosity of glycerine $=\ 8.10 \times 10^{-1} Ns/m^2$

Q.2   a) Check whether the following functions satisfy continuity and are valid potential functions; 06
            A is numerical constant
            1) $\emptyset = \frac{A}{2}(x^2 - y^2);$
            2) $\emptyset = A(\cos x + \sin y)$

        b) An idealized flow is given by $V = 2x^3\ i - 3\ x^2 y\ j$. Find velocity, acceleration of fluid   07
            particle in this flow at a point P (x,y,z)=(2,1,3)

Q.3   a) A venturimeter with 200 mm diameter at inlet and 100mm throat is laid with axis horizontal 10
            and is used for measuring the flow of oil of specific gravity 0.8. The difference in the levels
            of the U tube manometer reads 180mm of mercury while 11.52×10^3kg of oil is collected in
            4 min. Calculate the discharge co-efficient for the venturimeter. Specific gravity of mercury
            is 13.6.

        b) List the assumptions of Bernoulli's equation.   03

Q.4   Derive 3 dimensional continuity equation in Cartesian co – ordinates for steady, incompressible 13
    flow.

Q.5   Write short notes on any two of the following questions.   14

        a) Stability of floating and submerged body.
        b) Types of flow lines.
        c) Types of fluid.

1

SECTION – B

Q.6　a)　Derive the equation for displacement thickness of a boundary layer.　　08

　　　b)　For the velocity profile in laminar boundary layer as　　05

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

Find the thickness of the boundary layer and the shear stress 1.5m from the leading edge of a plate. The plate is 2 m long and 1.4m wide and is placed in water which is moving with a velocity of 200 mm per second. Find the total drag force on the plate if μ for water = 0.01 poise.

Q.7　Determine the rate of flow of water through a pipe of diameter 20 cm and length 50m when one end 13 of the pipe is connected to a tank and other end of the pipe is open to atmosphere. The pipe is horizontal and the height of water in the tank is 4m above the centre of the pipe. Consider all minor losses and take f = 0.009 in

$h_f = \frac{4flV^2}{2dg}$. draw HGL (Hydraulic gradient line) and TGL (Total energy line)

Q.8　Using Buckingham's pie theorem, show that the discharge Q consumed by an oil ring is given by　　13

$$Q = Nd^3 \emptyset \left[\frac{\mu}{\rho Nd^2}, \frac{\sigma}{\rho N^2 d^3}, \frac{w}{\rho N^2 d}\right]$$

Where d is the internal diameter of the ring, N is rotational speed, ρ is density, μ is viscosity, σ is surface tension and w is the specific wright of oil.

Q.9　a)　The ratio of lengths of a submarine and its model is 30:1. The speed of submarine　　08
　　　　　(prototype) is 10 m/s. the model is to be tested in a wind tunnel. Find the speed of air in wind
　　　　　tunnel. Also determine the ratio of the drag (resistance) between the model and its prototype.
　　　　　Take the value of kinematic viscosities for sea water and air as 0.012 stokes and 0.016 stokes
　　　　　respectively. The density for sea – water and air is given as 1030 kg/m^3 and $1.24 kg/m^3$ respectively.

　　　b)　Explain the significance of Dimensional analysis.　　05

Q.10　Write short notes on any two of the following questions.　　14

　　　　　a)　Characteristics of boundary layer.
　　　　　b)　Need for CFD
　　　　　c)　Reynold's experiment.

2

Examination NOV/DEC 2018

H-357

Total No. of Printed Pages:3

SUBJECT CODE NO:- H-357
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Fluid Mechanics-I
(OLD)

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
i) Q. No.1 and 6 are compulsory.
ii) Solve any two questions from remaining questions from each section.
iii) Assume suitable data, if necessary.

Section A

Q.1 Attempt any five from the following: 10

(1) What is the effect of temperature on viscosity of fluid.
(2) Define Surface Tension
(3) Enlist the different device used for measuring the pressure of fluid
(4) A liquid has dynamic viscosity of 0.1 poise and specific mass is 1594 kg/m^3. Calculate kinematic viscosity.
(5) Define the free-vortex flow.
(6) Define the streamline and streakline.
(7) Define the meta-centre and meta-centric height
(8) Define :- (i) Gauge pressure   (ii) Absolute pressure
(9) Define : (i) Laminar flow   (ii) Turbulent flow
(10) State Newton's law of viscosity

Q.2 (a) Derive an expression for total pressure and centre of pressure for inclined plane surface submerged in liquid. 08

(b) Define pressure and calculate the pressure due to a column of 0.4m of : 07
(i)   Water
(ii)   An oil of specific gravity 0.9
(iii) Mercury of specific gravity 13.6

Take density of water, ρ=1000 kg/m^3

Q.3 (a) Determine the total pressure or a circular plate of diameter 2.0m which is placed vertically in water in such a way that the centre of plate is 4m below the free surface of water. Find the centre of pressure also. 07

(b) What do you mean by single column manometer? Derive the equation of pressure for vertical single column manometer. 08

1

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Q.4   (a) Define the equation of continuity. Obtain an expression for Continuity equation for three   08
dimensional flow.

     (b) If for a two dimensional potential flow, the velocity potential is given by $\emptyset = x(2y - 1)$ 07
determine the velocity at point P(4,5). Determine also the value of stream function Ψ at the
point P.

Q.5   (a) What is Hagen Poiseuille's formula? Derive an expression for Hagen poiseuille's formula.   07

     (b) The velocity potential function ($\emptyset$) is given by an expression   08

$$\emptyset = \frac{-xy^3}{3} - x^2 + \frac{x^3y}{3} + y^2$$

       i)   Find the velocity components in x & y direction.

       ii)   Show that $\emptyset$ represent a possible case of flow.

Section B

Q.6   Solve any five from the following   10

       (i)   Write the assumption made in derivation of Bernoulli' equation.

       (ii)   State the momentum equation and give its expression.

       (iii)   Draw a neat diagram of Orificemeter.

       (iv)   Define Orifice and Mouthpiece.

       (v)   The head of water over an orifice having diameter of 2 cm is 1.25m.
Find the discharge through an orifice Assume Cd=0.62

       (vi)   Define the cipolletti weir & give the expression for discharge.

       (vii)   Define the terms, hydraulic gradient line and total energy line.

       (viii)   Enlist the different forces present in fluid flow

       (ix)   Define Fluid Dynamics

       (x)   Define the velocity Approach.

Q.7   (A) What is Pitot tube? Derive an expression to determine the velocity at any point with the help   08
of pitot tube?

     (B) A horizontal venturimeter with inlet and throat diameter 40 cm and 20 cm respectively is   07
used to measure the flow of water. The reading of differential manometer connected to inlet
and the throat is 20 cm of mercury. Determine the rate of flow. Take Cd=0.98.

Q.8   (A) Derive an expression for discharge through a large rectangular Orifice.   08

     (B) A convergent – divergent mouth piece having throat diameter of 4.0 cm is discharging water   07
under a constant head of 2.0m, determine the maximum outer diameter for maximum
discharge. Find the maximum discharge also. Take
H_a=10.3m of water and
H_{sep} = 2.5m of water (absolute).

Q.9 (A) Derive an expression for discharge over a stepped Notch. 08
    (B) Find the head lost due to friction in a pipe of diameter 300mm & length 50m, through which 07
        water is flowing at a velocity of 3m/sec by using Darcy formula & Chegy's formula for
        C=50.

Q.10 (A) What do you mean by Prandtl mixing length theory? Find an expression for shear stress due 07
     to Prandtl.
     (B) A main pipe divides into two parallel pipes which again forms one pipes. The length and 08
         diameter for the first parallel pipe are 2000 m and 1.0m respectively, while the length and
         diameter of 2ND parallel pipe are 2000 m & 0.8m. Find the rate of flow in each parallel pipe,
         if total flow in the main pipe is 3.0 m/sec. The co-efficient of friction for each parallel pipe is
         same and equal to 0.005.

3

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-358
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Fluid Mechanics-I
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
1) Question no.1 and 6 are compulsory.
2) Attempt any two questions from each section.
3) Draw neat sketches whenever necessary.
4) Assume suitable data if necessary.

Section A

Q.1   Answer the following (any five)   10

a) Define Dynamic Viscosity and Kinematic Viscosity.
b) State Newton's law of viscosity and its application.
c) Define the term centre of buoyancy.
d) Define the term meta-centre and meta-centric height.
e) Explain the term laminar and turbulent flow
f) Give classification of manometers.
g) Define Surface tension and state it's SI units.

Q.2   A) Derive an expression for the force exerted on a sub-merged vertical plane surface by the   08
static liquid and locate the position of centre of pressure.
B) A rectangular plane surface 1m wide and 3m deep lies in water in such a way that it's plane   07
makes an angle of 30 degree with the free surface of water. Determine the total pressure
force and position of centre of pressure, when the upper edge is 2m below the free surface.

Q.3   A) Derive an expression for the meta centric height of a floating body.   08
B) With neat sketches, explain the conditions of equilibrium for floating bodies and submerged   07
bodies.

Q.4   A) A 30 cm diameter pipe conveying water, branches into two pipes of diameter 20 cm and 15   06
cm respectively. If the average velocity in the 30 cm diameter pipe is 2.5m/s. Find the
discharge in this pipe. Also determine the velocity in 15 cm pipe if the average velocity in 20
cm diameter pipe is 2m/s.
B) In a two dimensional incompressible flow, the fluid velocity components are given by   09
$u = x - 4y$ and $v = -y - 4x$. Show that velocity potential exists and determine its form.
Find also the stream function.

1

Q.5   Answer the following question.

        A) Explain briefly working principle of bourdon pressure gauge with neat sketch.   07
        B) What is Hagen Poiseuille's formula? Derive an expression for Hagen Poiseuille's Formula   08

Section B

Q.6   Attempt any Five   10

        a) What is a venturimeter?
        b) Define Velocity approach.
        c) What do you mean by "Viscous flow"?
        d) What is Free jet of liquid?
        e) Enlist the forces acting on fluid in motion.
        f) What do you mean by Partially submerged Notch?
        g) What do you understand term "Boundary layer"?

Q.7   (A) Derive Bernoulli's equation from Fundamentals.   10
        (B) A pipeline carrying oil of specific gravity 0.87, changes in diameter from 200mm   05
            diameter at a position A to 500mm diameter at a position B which is 4m at a higher level.
            If the pressure at A and B are 9.81 N/cm^2 and 5.88 N/cm^2 respectively and discharge is
            200lit/sec. determine the loss of head and direction of flow.

Q.8   (A) Obtain an expression for time of emptying a tank through an orifice at its bottom.   08
        (B) A tank has two identical orifices on one of its vertical sides. The upper orifice is 4m below   07
            the water surface and lower one is 6m below the water surface. If the value of Cv for each
            orifice is 0.90 Find the point of intersection of the two jets.

Q.9   (A) Find an expression for the discharge over triangular notch or weir in terms of head of water.   08
        (B) A rectangular orifice 0.9m wide and 1.2m deep is discharging water from a vessel. The top   07
            edge of orifice is 0.6m below the water surface in the vessel. Calculate the discharge through
            the orifice. If Cd=0.6 and percentage error if the orifice is treated as a small orifice.

Q.10   Write short note

        A) Differentiate between stream lines body and bluff body.   06
        B) What are advantages and disadvantages of triangular notch over rectangular notch.   03
        C) Obtain an expression for discharge through a large rectangular orifice.   06

2

Total No. of Printed Pages:02

SUBJECT CODE NO: H-406
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Foundation Engineering
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.
N.B   i) Solve <u>any three</u> questions <u>from each section</u>.
        ii) Draw neat Sketches whenever required.
        iii) Assume suitable data if necessary and state it clearly

SECTION – A

Q.1 a) What are the factors that affect the sample disturbance? How are these effect minimised.   07

     b) Explain various method of drilling holes for subsurface investigations.   06

Q.2 a) Explain standard penetration test (SPT) in detail.   07

     b) Discuss cantilever footing in detail.   06

Q.3 a) Explain limitation of the Plate Load test.   06

     b) Discuss the consolidation settlement of soil.   07

Q.4 a) With the help of neat sketches, explain different types of raft foundation.   06

     b) A square footing has dimensions of $2m \times 2m$ and a depth of 2m. Determine it's ultimate   07
         bearing capacity in pure clay with an unconfined strength of $0.15 \ N/mm^2$, $\phi=0^0$ and
         $\gamma = 1.7g/cm^3$. Assume Terzaghi's factors for $\phi=0^0$ as $N_c = 5.7, N_q = 1, N_\gamma = 0$.

Q.5 Write short notes on   14

     a) Limitation of Terzaghi's theory of B.C.
     b) Wash Boring
     c) Seismic method of sub soil exploration

1

SECTION – B

Q.6   a) Determine the capacity of pile group in a clay of unconfined compressive strength of   10
$q_{ue} = 78 kN/m^2$ the natural water content is $W_n = 35\%$, bulk unit weight of soil $=$
$13 \ kN/m^2$. If the pile group has 3 rows and 4 pile in each row with c/c spacing of 0.9m
diameter of 250mm of length of 10m assume adhesion factor $\alpha = 1$.

     b) What are floating piles   03

Q.7   a) What are the different forces to be consider in the analysis of a well foundation?   06

     b) Describe the various components of a pneumatic caisson with the help of sketch.   07

Q.8   a) Explain different types of cofferdams with neat sketches.   07

     b) What is special about black cotton soil? What techniques are practiced in the design and   06
construction on black cotton soil?

Q.9   a) What are sheet piles and sheet pile waiting? Discuss   04

     b) Write a note on pumping and sealing of bottom of cofferdam.   06

     c) What is coffer dam? Name the different types of cofferdam   03

Q.10   Write Short note on
     a) Effect off pile driving on ground   05

     b) What are different various forces acting on well? Explain in detail   05

     c) Under reamed piles   04

Total No. of Printed Pages:2

SUBJECT CODE NO: H-449
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Elective-I: Ground Water Engineering
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B   i) <u>Q.1 and 6 is compulsory</u>.
             ii) Solve <u>any two</u> questions from remaining questions from <u>each section</u>.

SECTION – A

Q.1   Solve <u>any three</u>.   12
       a) Enlist points for site selection of well.
       b) Describe Specific yield.
       c) Explain Aquifers.
       d) Describe flow net analysis.
       e) Derive Dupuit's equation & applications.

Q.2   a) Enlist water bearing properties of rocks.   07
       b) Describe Infiltration mechanism in details.   07

Q.3   a) Describe various equations used for constant and variable head analysis.   07
       b) Explain different method for finding porosity in soil.   07

Q.4   a) Describe head distribution in details.   07
       b) Derive DuPuits equation and it's application for ground water flow.   07

Q.5   a) Describe Revitalization of well and its maintenance.   07
       b) Describe discharge analysis for aquifer.   07

SECTION – B

Q.6   Solve <u>any three</u>.   12
       a) Explain leaching and soil reclamation.
       b) Describe distribution networks for pumps.
       c) Explain Rain water harvesting.
       d) Describe Salinity influx in estuaries.
       e) Describe finite element method and applications.

1

| Q.7 | a) | Explain geological method for ground water exploration. | 07 |
| | b) | Explain Tracer techniques for ground water exploration. | 07 |

| Q.8 | a) | What is mean by Saline water intrusion? Define interface parameters. | 07 |
| | b) | What is mean by water shed management? How it will work for artificial recharge of ground water? | 07 |

| Q.9 | a) | How can define Pumps and its types for Suitability? | 07 |
| | b) | Explain action plans and legislations for Pollution control boards. | 07 |

| Q.10 | a) | Explain various methods for waste water recharge. | 07 |
| | b) | Explain magnetic methods for ground water exploration. | 07 |

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-448
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Elective-I: Plumbing Engineering
(REVISED)

[Time: Three Hours]   [Max. Marks: 80]

Please check whether you have got the right question paper.
N.B   i) Solve any three questions from each section.
             ii) Question No. 1 and 6 are compulsory.

Section A

Q.1   Solve any three   12
        a) Explain importance of ledge walls.
        b) Give table of minimum plumbing facilities.
        c) Explain oil and sand interceptors.
        d) What are the installation standards for plumbing fixtures and fixture fittings?
        e) Differentiate in between horizontal and vertical wet venting.

Q.2   a) Explain types of rat proofing in details.   07

        b) Describe water tanks and pump rooms as per Architectural and structural coordinates. 07

Q.3   a) Explain water closets, bidets , urinal and flushing devices in details.   07

        b) Explain table of minimum plumbing facilities in plumbing fixtures.   07

Q.4   a) What is mean by traps? Explain in details   07

        b) What is mean by indirect waste? Explain in details.   07

Q.5   a) How to locate location of columns and beams as per Architectural and structural point of 07
           view?

        b) Explain process in Details of combination waste and vent system.   07

1

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Section B

Q.6   Solve any three   12

      a) Describe in detail about underground drains.

      b) Explain rain water Harvesting.

      c) Explain color codes and arrow marking for pipes to water supply in High Rise building.

      d) What is requirement of electrical back up for solar hot water systems?

      e) How to calculate change in direction of flow for building sewers?

Q.7   a) What is mean by suds relief? Explain in Details.   07

      b) How to control pressure in water supply pipes for High rise buildings?   07

Q.8   a) Explain in details about, gutters, channels and scuppers.   07

      b) Derive expression for Thermal expansion for water supply pipes in High rise buildings.   07

Q.9   a) What is mean by sudsing stack, Explain in Details?   07

      b) Explain in details about pipes and fitting suitable for building sewers.   07

Q.10   a) Explain sizing calculation for water supply in High rise buildings.   07

      b) Explain in Details about Sewage disposal and septic tanks.   07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-456
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil/Mech./EE/ECT)
Elective-I: SAP Material Management - I
(REVISED)

[Time: Three Hours]   [Max.Marks: 80]

Please check whether you have got the right question paper.

N.B
1) Q.No.1 from Section A& Q.No.6 from Section B is compulsory.
2) From remaining questions in Section A& B student are supposed to solve any two questions from each section.
3) Assume suitable data wherever necessary.
4) Draw neat sketches wherever necessary.

Section A

Q.1   Write a short note on(Any Two)   10
   a) Management accounting & corporate governance.
   b) Life cycle management.
   c) Sales order management.

Q.2   a) Explain the procurement of consumable material.   07
       b) What are valuated & non-valuated receipts?   08

Q.3   a) Explain standard report in service.   07
       b) Explain drafting of material requisition planning.   08

Q.4   a) Explain system wide concept.   07
       b) Explain procurement of stock material.   08

Q.5   a) Explain the importance of batch record.   07
       b) Explain how you can link a document to a vendor master record?   08

Section B

Q.6   Write a short note on(Any Two)   10
   a) Basics of price determination.
   b) Explore source determination with quota.
   c) Extracting purchase information.

Q.7   a) Define function authorization for buyers & explain it in detail.   07
       b) What is invoicing plan?   08

Q.8   a) How to post invoice? Explain procedure.   07
       b) How to create invoice entry by applying taxes, cash discount & foreign currency.   08

1

Q.9   a) How to create purchase order with reference of source determination.   07
          b) Explain how to enter the invoice without reference to purchase order.   08

Q.10   a) What are the steps involved in consignment cycle.   07
          b) What is the difference between stock transfer between two plants belonging to same company 08
              code & those belonging to different company code?

2

Total No. of Printed Pages:04

SUBJECT CODE NO:- H-418
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (Civil)
Theory of Structure - II
(OLD)

[Time: Three Hours]   **[Max. Marks: 80]**

Please check whether you have got the right question paper.

N.B   i) Question No. 1 and 6 are compulsory. Answer any Two from Section A & section B
                    ii) Assume suitable data if necessary state if clearly.
                    iii) Figures to right indicate the maximum marks.
                    iv) Use of non-programmable calculator is allowed.

Section A

Q.1   a)   Define shape factor and find shape factor for a triangle of base b and height h.   04
         b)   What is plastic hinge and its important features.   03
         c)   What are the assumptions made in plastic theory?   03

Q.2   Analyse the frame as shown below by column analogy method and draw bending moment diagram.   15
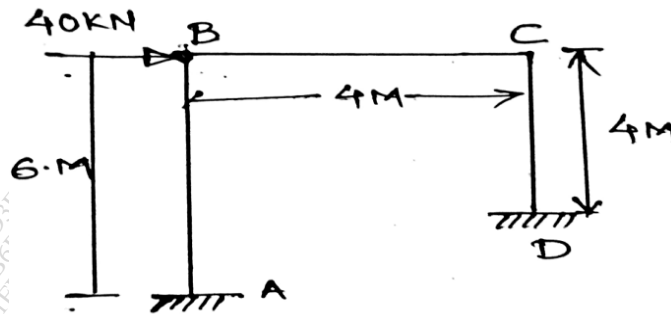
Q.3   Analyse the beam shown in fig below by using slope deflection method draw BMD & SFD.   15

101FB6D3FE14936E46016CC11B40FCBF
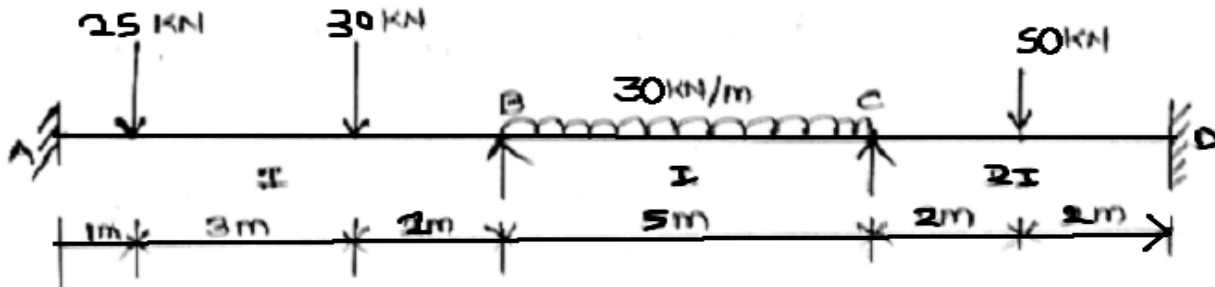
Q.4 A pin jointed truss as shown in fig below find the forces in the members. Cross sectional area of   15
horizontal member is 4000MM^2 , vertical member is 3000MM^2 and diagonal member is 5000MM^2 Take
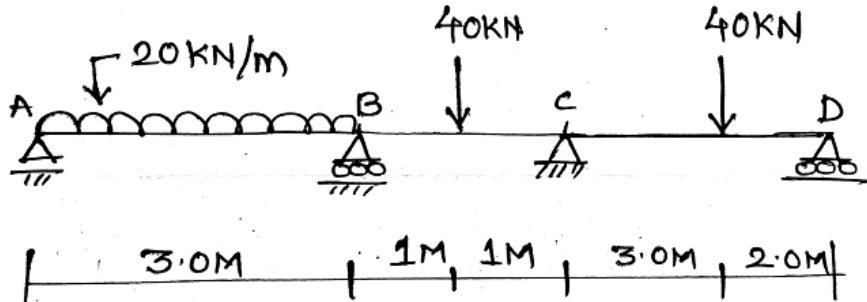$E = 2 \times 10^5 \, MPa.$
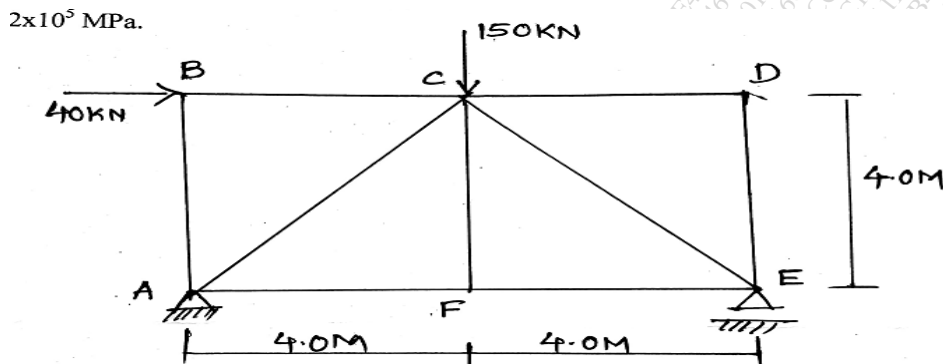
Q.5 Draw SFD,BMD for the beam shown in fig below by using SLOPE DEFLECTION METHOD. If   15
support B sinks by 2.50 mm. Take $I = 3.5 \times 10^7 mm^4$, $E = 200KN/M^2$
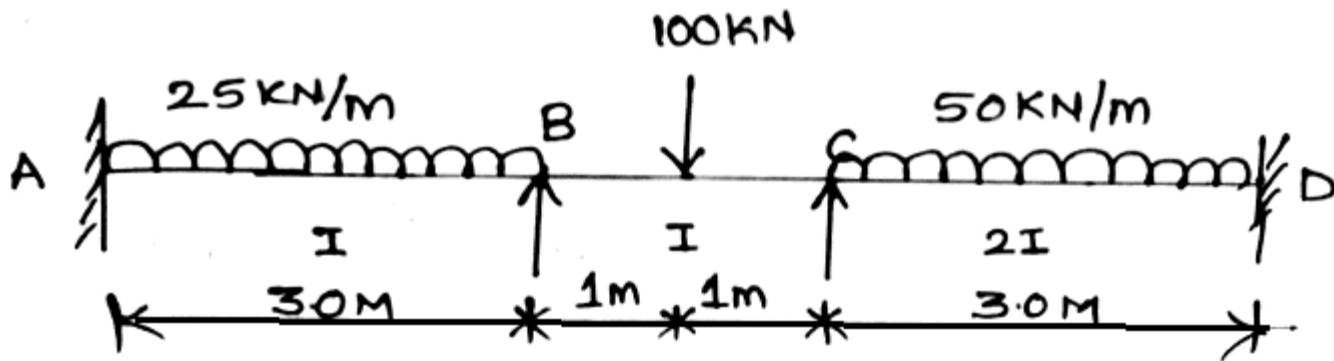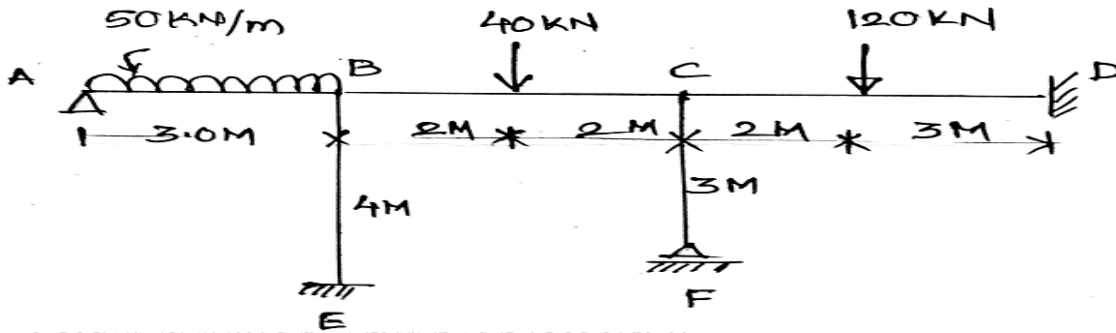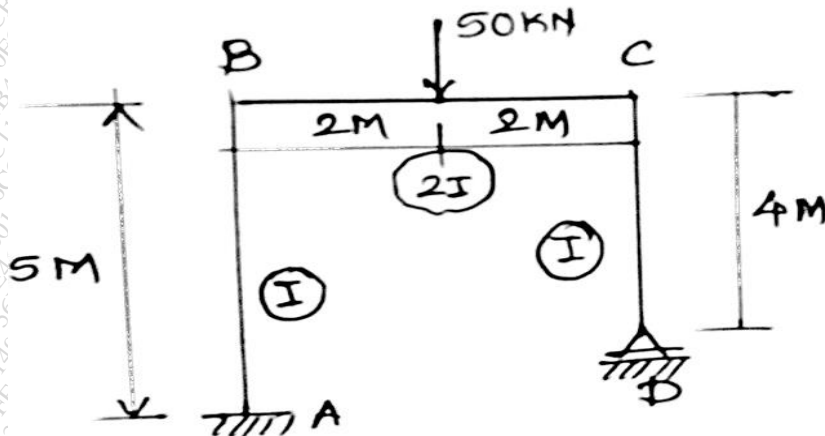
Section B

Q.6 Find the end moments of the members of the portal frame as shown in fig. by using MOMENT DISTRIBUTION METHOD.   10

Q.7 Find the end moments of the members of the portal frame as shown in fig. by using MOMENT DISTRIBUTION METHOD.   15

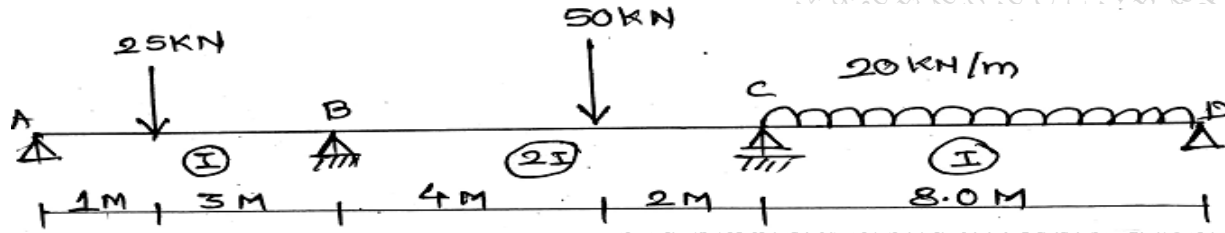**Q.8** Analyse the portal frame as shown in fig by using KANI'S METHOD. Draw BMD.   15

3

Q.9 Two hinged parabolic arch of span 40M and rise 8M is subjected to a rise of temperature of 30^0C. Find   15
the maximum bending stress at the crown due to temperature rise. The rib section is 1000MM deep. Take
$E = 2 \times 10^5 \; N/MM^2$ & $\alpha = 12 \times 10^{-6}$ per ^{0}C .

Q.10 Analyse the continuous beam and draw BMD.   15

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-337
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Water Resources Engineering-II
(REVISED)

[Time: Three Hours]   **[Max.Marks: 80]**

Please check whether you have got the right question paper.
N.B
1) Question no.1 and Question no.6 are compulsory.
2) Attempt any two questions from remaining questions from each section.
3) Figures to right indicate the maximum marks.
4) Assume suitable data, if necessary.

Section A

Q.1   Attempt any Five.   10
a) What is meant by a Dam & Reservoir?
b) Define with neat sketch mass curve and demand curve.
c) Give the classification of dams.
d) Give the wave height formulae's and explain the terms in it.
e) Define phreatic line and show its probable path in an earthen dam.
f) Define arch dam and buttress dam with sketch.
g) Draw a neat diagram of elementary profile of gravity dam.

Q.2   a) Explain the procedure for calculating the reservoir capacity for a specific yield from the mass   08
inflow curve.
b) Discuss the factors which affect the selection of site for dam.   07

Q.3   a) Determine the uplift pressure on a gravity dam having 35.0m height 8.0m top width, 20.0m   08
base width and up-stream face vertical. The tail-water depth is 3.5m and free board is 1.5m.
Also determine the uplift pressure when there is a drainage gallery at a distance of 4.0m from
the up-stream face.
b) Discuss the stability analysis of a gravity dam.   07

Q.4   a) Draw the typical cross-sections of earth dams when: 09
i.   Only pervious material is available.
ii.   Only impervious material is available.
iii. Both pervious and impervious materials are available.
b) Explain with neat sketch multiple arch type buttress dam.   06

Q.5   Attempt any Three.   15
a) Write a short note on Joints in gravity dam.
b) Write a short note on maintenance of earthen dam.
c) What are the characteristics of the phreatic line?
d) Explain with neat sketch effect of tension cracks.

1

Section B

Q.6 Attempt any Five. 10
- a) Define spillway and enlist its types.
- b) Define canal and canal lining.
- c) What is a necessity of cross drainage works?
- d) Define head regulator and cross regulator.
- e) Draw a typical layout of diversion head-works.
- f) Define weir and barrage.
- g) Define with neat sketch syphon spillway.

Q.7 a) Enumerate the important types of spillway gates. Describe with a neat sketch the construction 08
and working of Tainter gates.
- b) Find the channel section and discharge Q that can be allowed to flow in it. If B/D = 5.4, bed 07
slope=1/5200 and N=0.0225. Use Kennedy's theory.

Q.8 a) Discuss various design features of cross regulators and distributary head regulator. 07
- b) Explain with neat sketch various roughening devices. 08

Q.9 a) Explain with neat sketch Bligh's creep theory for seepage flow. 08
- b) Explain the design of an ogee-shaped spillway. How would you fix the d/s and u/s profiles? 07

Q.10 Attempt any Three. 15
- a) Explain with neat sketch side channel spillway.
- b) Define: Permanent Canals, Feeder canals, Main canal, alluvial canals, and Lined
canals.
- c) Define canal fall and explain with neat sketch stepped fall and ogee fall.
- d) List out the different functions served by scouring sluices.

Total No. of Printed Pages:2

SUBJECT CODE NO: H-372
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Design of Structures-III
(REVISED)

[Time: Four Hours]   **[Max.Marks: 80]**

Please check whether you have got the right question paper.

N.B   i)   Solve <u>any two</u> questions from <u>section A and Section B each</u>
       ii)   Use of IS: 456, IS:3370, IS:1343, and IS:875 is permitted
       iii) Assume suitable data, if necessary and state it clearly

Section A

Q.1 Two columns 5 meter apart centres carry the load of 1600KN and 2400 KN respectively. The size of   20
columns are $600mm \times 600mm$ and $750mm \times 750mm$. Design the combined trapezoidal footing for
the columns. The projection beyond the centre line of the column parallel to the length of footing are
limited to 0.8 meter and 1.4 meter respectively approximate weight of footing may be taken as 320 KN.
Safe bearing capacity of soil is $300KN/M^2$. Use M-30 and Fe-500. Also draw the reinforcement
diagrams.

Q.2   a)   A large banking hall 18 $meter \times 20\ meter$ is to be provided with flat slab without drop. The   15
columns are placed 4.5 meter centre to centre along the shorter span and 5 meter centre to centre
along longer span. Design interior panel of flat slab for live load of $4KN/M^2$ floor finish of
$1\ KN/M^2$. Use M-25 and Fe-415. Also draw the reinforcement diagrams

       b)   Explain the difference between direct design method and equivalent frame method of design of   05
flat slab. Also explain the advantages and disadvantages of flat slab

Q.3 Design a counterfort retaining wall for the following data: 20
       i)   Height of stem above ground level=7.5 meter
       ii)   The earth fill level with top
       iii)   Density of earth fill $= 16\ KN/m^3$
       iv)   Angle of repose$= 28^0$
       v)   Foundation depth below ground level =2meter
       vi)   Safe bearing capacity of soil $= 200\ KN/m^2$
       vii)   Spacing of counterfort= 3.5meter centre to centre
       viii) Coefficient of friction $= 0.6$
       ix)   Use M-40 and fe-415 Also draw the reinforcement diagrams

1

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Section B

Q.4 Design an underground water tank $4\ meter\ \times 10\ meter\ \times 3\ meter$ deep. The sub soil consists of 20 sand having angle of repose of 30^0, and saturated unit weight of $17 KN/m^3$. The water table is likely to rise upto ground level. Use M-30 grade of concrete and fe-500 grade of steel. Take unit weight of water as $9.81\ KN/m^3$ draw neat sketches of reinforcement detailing

Q.5 a) Explain the necessity of high grade concrete and high tensile stress wires in prestressed concrete 08 members

b) State the advantages and disadvantages of prestress concrete. Also state the methods of 09 prestressing with their advantages and disadvantages.

c) State the principles of prestressing 03

Q.6 a) Design a circular slab for the room 5 meter in effective diameter, the circular slab is simply 07 supported at the edges and carries live load of $4\ KN/m^2$. The slab has finishing coat of 20mm cement concrete. Density of finishing coat $=24\ KN/m^3$. Use M-25 and fe-500. Draw neat sketches of reinforcement detailing

b) Design a form work for the beam for the following data 13
    i) Thickness of floor= 120 mm
    ii) Centre to centre spacing of beams =3 meter
    iii) Width of beam=300mm
    iv) Height of ceiling of the roof=4 meter
    v) Take live load on sheathing as 4000 N/m^2 and dead weight of wet concrete as 26.5 KN/m^3

Total No. of Printed Pages:3

SUBJECT CODE NO:- H-392
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Surveying-I
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B   i) Q. No.1 & Q. No.6 are compulsory.
            ii) Solve any two questions from the remaining questions from each section.
            iii) Assume suitable data, if necessary.
            iv) Figures to the right indicate full marks.

Section A

Q.1   Solve any Five   10

1) What are the objects of surveying
2) What are the principles of surveying.
3) Define Ranging? What are the kinds of ranging?
4) Define Offsets?
5) What are the code of signals for ranging. Write any two signal with actions?
6) Define (A) True Meridian
         (B) True Bearing
7) Define (a) F.B.   (B) B.B.
8) Define telescope normal.
9) What do you mean by Transiting?
10) Define plane table surveying? What is the principles of plane table surveying?

Q.2   A) What are the types of chains? Explain Briefly?   07
         B) The distance between two stations was 1200m when measured with a 20M Chain the same   08
            distance when measured with 30M chain was found to be 1195M. If the 20M chain was 0.05
            M too long. What was the error in the 30M Chain?

Q.3   A) Explain field procedure for Measurement of deflection angle with the help of neat sketch   07
         B) The following are the Fore & Back Bearings of the sides of a closed traverse: 08

Side	F.B	B.B
AB	150° 15′	330°15′
BC	20° 30′	200° 30′
CD	295° 45′	115°45′
DE	218°0′	38°0′
EA	120°30′	300°30′

Calculate the interior angles of the traverse.

1

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Q.4 A) Explain field procedure for – measurement of Reiteration method with the help of neat sketch. 07

B) A closed traverse conducted around an optical & following observation are made work out the omitted or Missing Data. 08

Line	Length	W.C.B
AB	500	98° 30′
BC	620	30° 20′
CD	468	298°30′
DE	?	230° 0′
EA	?	150°10′

Q.5 A) What are the advantages and disadvantages of plane table surveying. 07

B) Explain field procedure of the Horizontal distance between them two inaccessible points by Intersection method. 08

Section B

Q.6 Solve any Five 10

1) Define Line of Collimation
2) Define (i) Change Point
   (ii) Fore Sight
3) Give the formula for curvature correction.
4) Give any two difference between collimation & Rise & Fall System.
5) Define contour line
6) Give the Area formula by Simpson's rule
7) Define stadia? What is the principle of tacheometer
8) Define (i) Elevation
   (ii) level line
9) Give the volume formula by Trapezoidal rule
10) Define (i) B.M (ii) M.S.L.

Q.7 A) What are the classifications of leveling. Explain any two in detail with neat sketch. 07

B) The following consecutive readings were taken with a level & a 4Mt leveling staff. On-Continuously sloping ground at a common interval of 30 mt 0.585 on A0.936 1.953, 2.846, 3.644, 3.938, 0.622, 1.035, 1.689, 2.534, 3.844, 0.956, 1.579, 3.016 on B the elevation of A=520.450 Make up a level book & Apply usual checks. 08

Q.8 A) What are the uses of contour ? 07

B) It was required to ascertain the elevation of two points P& Q & a line of levels was run from P to Q the leveling was then continued to a bench Mark of 83.500 the readings obtained being as shown below obtain the R.L of P&Q. 08

2

Station	B.S.	I.S	F.S	R.I	Remarks
1	1.622				P
2	1.874		0.354		
3	2.032		1.780		
4		2.362			Q
5	0.984		1.122		
6	1.906		2.824		
7			2.036	83.500	B.M

Q.9 A) What do you mean by Planimeter? What are the uses of planimeter 07

B) An Embankment of width 10m & side slope 1 ½ :1 is required to be made on ground which 08
is level in a direction traverse to the centre line the central heights at 40M intervals are as
follows:-
0.90, 1.25, 2.15, 2.50, 1.85, 1.35 & 0.85. Calculate the volume of Earth work according to
(i) The trapezoidal formula
(ii) The prismoidal formula

Q.10 A) (i) What are the characteristics of tacheometer. 07
(ii) What are the advantages of tacheometeric surveying.

B) A Tacheometer was set up at station 'A' & following readings were obtained on a vertically 08
held staff.

Instrument Station	Staff Station	Vertical angle	Hair reading
A	B.M.	$-2°18'10''$	3.225 3.550 3.875
	B	$+8°36'0''$	1.650 2.515 3.380

Calculate horizontal distance from A to B & R.L of B.M if constants of instruments
were K=100 C=0.40   B.M. of R.L = 437.655

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-383
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (Civil)
Transportation Engineering-I
(OLD)

[Time: Three Hours]   [Max. Marks: 80]

Please check whether you have got the right question paper.
N.B   i) **Q. No.1** and **Q.No.6** are compulsory.
                ii) Attempt any **Two** questions from remaining in each section.
                iii) Figures to the right indicate full marks.
                iv) Assume suitable data if necessity.

Section A

Q.1   Define the following term(Any five)   10
       a) Buckling of rail
       b) Skew bridge
       c) Runway
       d) Deck slab
       e) Scour Depth
       f) Cause ways
       g) Suspension bridge
       h) Culvert

Q.2   a) Define economic span for a bridge? Derive the relation for the economic span for a bridge.   08
       b) What is the requirement of an ideal bridge?   07

Q.3   a) Describe the method adopted for constructing well foundation in shallow water.   08
       b) What is coffer dam? Where it is used? Explain with neat sketch the construction of any coffer 07
          dam used in shallow water.

Q.4   a) What are the characteristics of an ideal airport layout?   08
       b) Discuss in detail the Geometric design of Airfields   07

Q.5   Write short note on (any three)   15
       a) IRC Loading on bridge.
       b) Back water
       c) Strengthening of bridge
       d) Wind rose diagram
       e) Location of pier and abutments

1

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Section B

Q.6   Define the following Term(Any five)   10

  a) Platform
  b) Interlocking
  c) Buckling of rail
  d) Yard
  e) Water column
  f) Turn Table
  g) Gradient
  h) State fixture and fastening

Q.7   a) Write a short note on signalling during track maintenance   08
       b) What are functions of points and crossing in railway track?   07

Q.8   a) What are the requirements of rails? Explain the advantages and disadvantages of flat footed   08
           rails.
       b) Explain in detail Equilibrium super elevation.   07

Q.9   a) What are the functions of railway sleepers? Explain in detail any one type of sleeper.   08
       b) What is station yard? What are the different types of yards? Describe any one in detail.   07

Q.10   Write a short note on (Any Three)   15

  a) Tilting of rail? Why it is being adopted.
  b) Modern trends in railway.
  c) Renewal of ballast.
  d) Hocks and harbours.
  e) Coning of wheel.

2

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-447
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Elective-I: Computer Applications in Civil Engg.
(REVISED)

[Time: Three Hours] **[Max. Marks: 80]**

Please check whether you have got the right question paper.

N.B   i) solve any three questions from each section .
   ii) Q.1 & 5 are compulsory.

Section A

Q.1   Solve any three   12
        a) Derive finite difference approximation for Taylor series.
        b) Explain finite difference method
        c) Explain finite element method.
        d) Differentiate in between pin jointed frame and rigid jointed frame.

Q.2   Derive equation for long column by using finite difference method.   14

Q.3   Analyse shape function for 2-D by using finite element method.   14

Q.4   Analysis plane stresses for 3-D object by using finite element method. 14

Section B

Q.5   Solve any three   12
        a) Describe in details about rigid jointed frames.
        b) Explain degree of freedom system.
        c) Describe equation of motion.
        d) Describe earth quake response of linear system.

Q.6   Mane logical flow chart for analysis of plate for SCILAB   14

Q.7   A machine weighting 1000N is mounted through spring having a total stiffness $x = 2000\ N/M$ to a   14
        simple supported beam as shown in fig. a. Determine using the analytical model shown in fig. (b) .
        The equivalent mass $m_\in$, the equivalent spring constant $k_\in$. and the equivalent damping
        coefficient $C_\in$ for the system assumed to have 10% of the critical damping. Neglect the mass of the
        beam.

1

$E_1 = 10^3 N/M^2$ Fig.(a)

L=4m

Fig .(b)
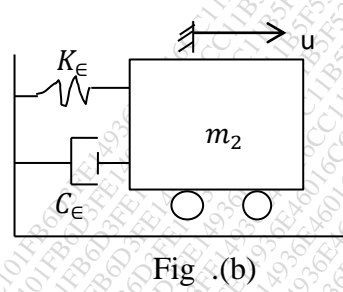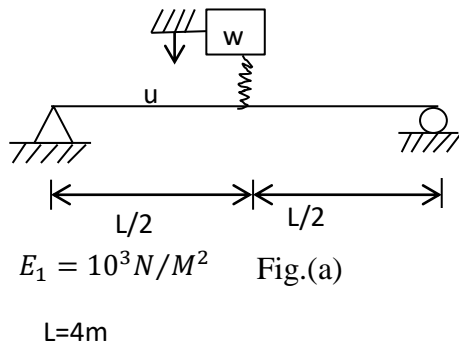
Q.8   A simple beam supports at its centre a machine having a weight $w = 16000 kg$. The beam is made of 14
two standard 58×23 sections with a clear span $L = 4m$ and total cross sectional moment of lnertia
$I = 2 \times 517.5 \times 10^6 = 1035 \times 10^6 mm^4$. The motor runs at 300rpm, and its rotor is out of
balance to the extent of $w = 18.5$ kg at an eccentricity of 260mm. what will be the amplitude of the
steady . State response if the equivalent viscous damping for the system is assumed 10% of the
critical?

L=4m

2
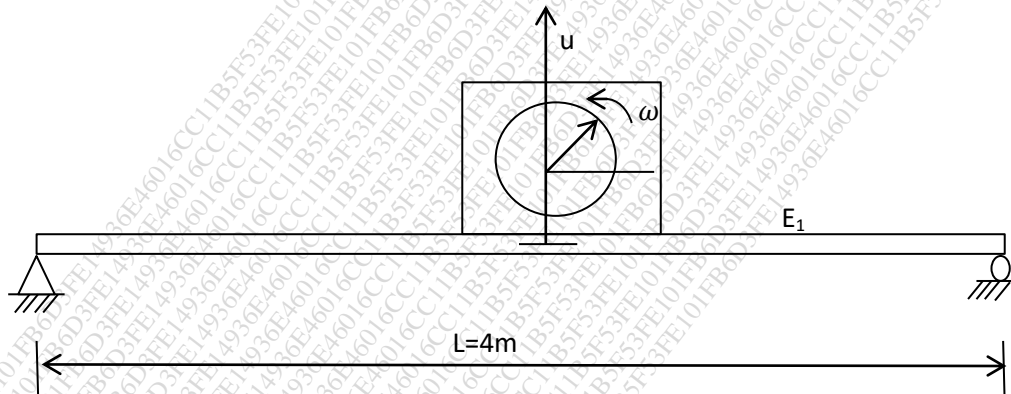
Total No. of Printed Pages:2

SUBJECT CODE NO:- H-446
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Elective-I: Town Planning
(REVISED)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1. Question no.1 and question no.6 are compulsory.
2. Solve any two question from question no2 to 5 and any two question from Q.no.7 to 10
3. Figures to right indicate the maximum marks.

Section A

Q.1   Write short notes on any two questions from the following.   10
      i)   Organic concept of town
      ii)   Town planning ancient art and science
      iii)   National planning
      iv)   Duties and power of town planning officer

Q.2   a) Explain the principle of town planning.   08
      b) What are the aims and objectives of town planning?   07

Q.3   a) Explain with neat sketch town planning in Indus valley civilization.   08
      b) What are the different stages in the growth of town?   07

Q.4   a) Explain the first sanitary and public health act of Great Britain of 1840.   08
      b) Explain the concept of Garden city.   07

Q.5   a) Explain the principle underlying Building Bye laws.   08
      b) Explain impact of industrialization on town planning   07

Section B

Q.6   Write short notes on any two of the following   10
      i)   Radial Town
      ii)   Rapid Transit system
      iii)   Creative Planning
      iv)   Grouping of public Building

Q.7   a) How the aesthetic of town planning is accomplished? Explain in details.   08
      b) What are the types of survey? Explain town survey in detail.   07

1

Q.8	a)	Explain classification of urban roads.	08
	b)	Explain selection of site for industries?	07
Q.9	a)	Explain the principle of neighborhood planning.	08
	b)	Explain in details the causes of slum.	07
Q.10	a)	Explain the features of Master Plan.	08
	b)	What are the housing problems in India?	07

2

Total No. of Printed Pages:03
SUBJECT CODE NO:- H-445
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Elective-I: Prestressed Concrete
(REVISED)
[Time: Three Hours]   [Max.Marks:80]
Please check whether you have got the right question paper.

N.B
1. Solve any three questions from section A and B each.
2. Use of IS 1343 and IS 456-200 is allowed.
3. Assume suitable data where required and mention it clearly.
4. Draw neat sketches in justification where necessary.

Section A

Q.1   A presteressed concrete girder of 30.0 m span is of unsymmetrical section having dimensions as   13
below, top flange: 1200 x 250 mm thk., bottom flange: 500 x 400 mm thk., web: 200mm thk and
1800 mm overall depth. The steel is located at a distance of 200 mm from the soffit of the beam.
The girder supports a uniformly distributed dead load of 34.887 kN/m and concentrated dead load
of 15 kN at each 5.0 m interval. The maximum live load bending moment at the entire span is
estimated to 2974 kNm. The girder is prestressed by a parabolic cable with an effective force of
5145 kN. Determine the stress distribution at the center of the span section under service load.

Q.2   A PSC beam 300mm wide and 600mm deep prestressed with tendons of area 250 mm^2 located at   13
constant eccentricity of 100 mm and carrying an initial stress of 1050 N/mm^2. The span of the
beam 10.00m. calculate the % loss of stress in the tendons if,
1) The beam is pretensioned
2) The beam is post tensioned. Use following data,
Anchorage slip = 1.50mm, coefficient of friction due to wave effect = 0.0015/m, $\mu = 0.5$, ultimate
creep strain = 40^*10^{-6} and 20^*10^{-6} for pre and post tensioned members respectively, shrinkage
of concrete = 300^*10^{-6} and 200^*10^{-6} for pre and post tensioning respectively, relaxation of
stresses in steel = 2.5%.

Q.3   The end block of PSC beam is rectangular in c/s 100mm wide and 200mm deep. The prestressing   13
force 100kN is transmitted to the concrete by distribution plate 100 mm wide and 500mm depth,
concentric at end. Calculate the position and magnitude of maximum tensile stress of horizontal c/s
through the center of the anchor plate, using "Magnels method". Use following constants.

Distance from far end(x/h)	K$_1$	K$_2$	K$_3$
0.3	-1.96	1.96	2.058
0.4	-4.32	2.16	1.728
0.5	-5.00	2.00	1.250

Q.4   A pretensioned beam of rectangular section 80 mm wide and 120mm deep is to be designed to   13
support concentrated load of 4.0 kN each at one third span over an effective span of 3.0m. The
permissible stresses in concrete are limited to zero and 1.40 N/mm^2 in tension at transfer and
working load respectively. If 3.0mm dia. Wires initially stressed to 1400 N/mm^2 are use, find the
number of wires required and eccentricity of prestressing force assuming 20% losses in the
prestress. Assume weight of concrete as 25.0 kN/m^3.

Q.5   Answer any three of the following
1.   Explain the load balancing concept when the cable is bent up and cable is parabolic.   04
2.   Differentiate between pre and post tensioning.   04
3.   Derive expression for losses due to friction in post tensioning. Also explain how the losses   05
     due to friction can be reduced?
4.   With the help of neat sketch explain in detail Freyssinet system of prestressing.   05

Section B

Q.6   a) What is the need of providing minimum shear reinforcement for the beam section?   02
       b) A PSC beam of unsymmetrical I section has following dimensions, top flange 500 x   11
           210mm, web 470 mm depth and 120 mm thick, bottom flange 300 x 200 mm. area of
           prestressing steel 1000mm^2. The tendon is located at 150 mm form soffit of beam.
           Calculate the u.d.l. the beam can carry exclusive of its own weight over simply supported
           span of 16.0 m. consider grade of concrete M45 and $f_p = 1500 \, N/mm^2$.

Q.7   Design suitable section for a tie member of a truss to support maximum design tensile force of 450   13
       kN. The permissible compressive stress in the concrete is 15 N/mm^2 and no tension is permitted at
       working load. The loss ratio is 0.80. The Ht wires used are of 7.0 mm diameter having ultimate
       strength of 1700 N/mm^2, with an initial stress of 950 N/mm^2. The direct tensile stress of the
       concrete is 3.0 N/mm^2. A load factor of 1.5 at limit state of collapse and 1.25 against cracking is
       required.

Q.8   A 6.0 m span composite section beam consisting of 150mm x 300mm precast stem and 500mm x   13
       60mm cast in situ flange. The stem is post tensioned unit subjected to an initial prestressing force
       of 315 kN. The loss of prestress is 20%. The tendons are provided such that their center of gravity
       is 100 mm from the soffit. The composite section has to support the live load of 4.50 kN/m.
       Determine the resultant stress in the stem and flange. Assume that the beam is unpropped beam.
       Modulus of elasticity for precast unit and flange as 30 kN/mm^2 and 24 kN/mm^2 respectively.
       Weight of flange and stem concrete is 25 kN/m^3.

Q.9   a) An electrical pole 9.50m high above GL supports vertical load of 1.50 kN due to weight of   11
            wires. It has to carry the reversible horizontal force of 3.25 kN acting at top. Design the
            pole assuming losses due to shrinkage and creep as 15%, no tension is allowed. The safe
            bearing compressive stress is 12.50 N/mm^2, angle of repose is 30^0, density of soil 20
            kN/m^3, initial stress in steel is 950 N/mm^2 and m = 6.

       b) As recommended by IS 784, write down the five stages which shall be considered for   02
            design of prestressed concrete pipe.

Q.10   Answer any three of the following.
       1) Which are the major modes of failure of shear cracking? Explain with neat sketches web   05
            shear cracking.
       2) Explain in detail the IS code method for computing the flexural strength of PSC section.   04
       3) Which are different types of PSC pipes? How they are classified depending upon the   05
            method of construction? Draw a neat sketch of section of pipe which shall cover
            reinforcement details and joints.
       4) Explain the structural difference between one way and two way slab. Write down the   04
            expression for computing the prestressing force for one way slab explaining all the
            terminologies in the same.

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-427
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Concrete Technology
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.
N.B   i) Q. No.1 and Q.No.6 are compulsory. Attempt any two questions from each section
             From remaining.
             ii) Draw neat sketch wherever necessary.
             iii) Figure to the right indicate full marks.

Section A

Q.1   Answer the following questions (Any Five)   10

         (a) What are the basic raw material used for manufacturing of cement.
         (b) What is soundness of Cement.
         (c) Why rapid hardening cement is not suitable for mass concreting.
         (d) Is strength of OPC cement [28 days] is more than PPC Cement, Justify Answer
         (e) What is cohesive concrete, Explain with Example.
         (f) Which solution is used for determining soundness of Aggregate.
         (g) What are admixture? Explain suitability to use retarders.
         (h) What is difference between compaction Factor and Slump value in Fresh concrete
         (i) What is roburstness of concrete.
         (j) Why pozzollanic material is used in High performance concrete.

Q.2   (a) What are the methods used for manufacturing of cement. Explain in detailed wet process.   07
         (b) What is the reason that Indian Standard code does not permit to use volume batching.   08
             Explain the phenomenon of bulking of sand and How bulking of sand is determined.

Q.3   (a) What is Alkali Aggregate reaction.   04
         (b) What are the test available to measure workability of concrete. Explain slump cone Test.   06
         (c) When admixture is required for manufacturing of concrete. Explain the functions of any two 05
             Admixtures.

Q.4   (a) What is Fineness modulus. Give the range of finness modulus of Fine Aggregate and   08
             determine the Finness modulus of sand sample weigh 950 gm, weight retained on each
             sieves are given below

Is sieve Numbers	4.75 mm	2.36 mm	1.18 mm	600 micron	300 mic	150 mic	75 micron
Weight retained in gms.	73	205	146	312	114	87	13

1

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(b) Explain Factors affecting on properties of Hardened concrete 07

Q.5   (a) Explain the relation between Tensile and compressive strength of concrete. 06
     (b) Explain rebound hammer test with Neat Sketch. 05
     (c) Why compaction of concrete is required. Explain any one method used for compacting the concrete with Neat Sketch. 04

Section – B

Q.6   Answer the following (Any Five)   10

     (a) What is mix design.
     (b) What is high density concrete
     (c) What is Aerated concrete
     (d) Enlist Factors affecting on permeability of concrete.
     (e) What are Fibers? Enlist Fibers used in concrete.
     (f) What is efflorence of concrete.
     (g) Enlist methods (codes) used for mix design of concrete.
     (h) Factors affecting cracks in concrete.
     (i) What is pumping of concrete when it is generally used.
     (j) What is Target mean strength in concrete mix design.

Q.7   (a) What are the data required for mix design of concrete. Explain step by step procedure for mix design of concrete as per IS10262.2009. 10
     (b) Write a Note on under water concreting with Neat Sketch. 05

Q.8   (a) What should be the minimum time for mixing the concrete. Explain various types of mixers used for concrete manufacturing. 05
     (b) Differentiate between light weight concrete and High density concrete. which material generally used for manufacturing of light weight concrete and High density concrete. 05
     (c) Explain factors affecting on durability of concrete. 05

Q.9   (a) Explain sulphate attack and corrosion of reinforcement. 08
     (b) What is repair, state symptoms and diagram of distress. 07

Q.10   (a) Is it possible to used plastic and glass in manufacturing of concrete. Write a short Note on use of wastes in concrete. 05
     (b) What is ready mix concrete. Explain merits of ready mix concrete along with few demerits if any. 05
     (c) What is carbonation. Explain its significance. 05

Total No. of Printed Pages:2
SUBJECT CODE NO: H-391
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Surveying-I
(OLD)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.
N.B   i) <u>Q.No.1 and Q.No.6 are compulsory</u>.
            ii) Solve <u>any two</u> questions from the <u>remaining questions from each section</u>.
            iii) Figures to the right indicate the maximum marks.
            iv) Assume suitable data if necessary.

Section A

Q.1   Attempt <u>any five.</u>   10
       a) What is 'orienting the table' in plane table survey?
       b) What is ranging? Explain method of ranging a line across rising ground.
       c) Give the primary classification of survey Distinguish between them.
       d) State basic principal of survey.
       e) Define i) Bench mark ii) Height of instrument
       f) What do you mean by representative fractions?
       g) What are isogonic and agonic lines?
       h) What does the 'swinging the telescope' mean?
       i) Explain temporary adjustment of prismatic compass.
       j) State 'Three Point Problem'.

Q.2   a) How is graphical adjustment of closing error done in closed traverse?   07
       b) The distance between two stations was 1200m when measured with a 20m chain. The same 08
           distance when measured with 30m chain was found to be 1190m if the 20m chain was
           0.05m too long what was the error in the 30m chain?

Q.3   a) What are the different methods plotting traverse? Explain each of the methods in brief.   07
       b) The following fore and back bearings were observed while traversing an area with a   08
           compass

Lines	FB	BB
PQ	$S\ 37^o\ 30'\ E$	$S\ 37^o30'\ W$
QR	$S\ 43^o15'\ W$	$S\ 44^o15'\ E$
RS	$N\ 73^o00'\ W$	$S\ 72^o15'\ E$
ST	$N\ 12^o45'\ E$	$S\ 13^o15'\ W$
TP	$N\ 60^o00'E$	$S\ 59^o15'\ W$

Find the corrected bearing of the line.

1

Q.4	a)	What is meant by face left and face right of theodolite? How would you changes face? What instrumented errors are eliminated by face left and face right observations.	08
	b)	The record of a closed traverse is given below, with two distances missing	07

Lines	Length (m)	Bearing
AB	100.5	$N\ 30^o30'\ E$
BC	?	$S\ 45^o00'\ E$
CD	75.0	$S\ 40^o30'\ W$
DE	50.5	$S\ 60^o00'\ W$
EA	?	$S\ 40^o15'\ W$

Q.5	a)	Describe the steps involved in setting up of a plane table. Explain the method of orientation by back sighting and using compass.	07
	b)	Explain Bessel's method in details.	08

Section B

Q.6	Attempt <u>any five</u>.	10
	a) Write short notes on prismoidal correction.	
	b) What is contour gradient?	
	c) Explain temporary bench-mark.	
	d) What is fly levelling?	
	e) Define zero circle area of planimeter.	
	f) State the trapezoidal rule and limitations of this rule?	
	g) What is deflection angle?	
	h) Differentiate between tacheometer and theodolite.	
	i) What is basic principal of tacheometry?	
	j) Differentiate between line of collimation and axis of telescope.	

Q.7	a)	What is the principal of equalising backsigh and foresight distances?	07
	b)	What are the difficulties faced in leveling Explain with neat sketches.	08

Q.8	a)	What are the different methods of countouring? Describe any method along with sketch.	07
	b)	Explain the procedure for extending a survey line by "Double Sighting Method".	08

Q.9	a)	State the Trapezoidal rule and Simpson's rule. What is the limitation of Simpson's rule?	07
	b)	The following offsets were taken from a chain line to an irregular boundary line at an interval of 10m 0, 2.50, 3.50, 5.00, 4.60, 3.20, 0m Compute the area between chain line, the irregular boundary line and end offsets by 1) The mid-ordinate rule 2) Trapezoidal rule 3) Simpson's rule	08

Q.10	a)	Explain the object and theory of anallatic lens.	08
	b)	Derive the expression for horizontal and vertical distances in the fixed hair method when the staff is held vertically and the measured angle is that of elevation.	07

2

Total No. of Printed Pages:3

SUBJECT CODE NO: H-426
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Concrete Technology
(OLD)

[Time: Three Hours]   [Max.Marks: 80]

Please check whether you have got the right question paper.

N.B
i) Solve <u>any two</u> questions from <u>question No. 2 to 5</u> and <u>any two</u> from <u>question no. 7 to 10</u>
ii) <u>Question No. 1 and Question No. 6 are</u> compulsory
iii) Figures to right indicate the maximum marks
iv) Assume suitable data, If any

Section A

Q.1 Answer the following questions (<u>Any five</u>)   10
a) Enlist five types of cement?
b) What is high strength concrete?
c) What is fineness of cement explain its significance?
d) What is formwork where they are used?
e) What are the admixtures?
f) Enlist the different types of non-destructive testing?
g) What are various types of Pozollanic materials?
h) What is curing? What are various methods?
i) What is bulking of sand?
j) What are the raw materials used manufacturing of cement?

Q.2 a) What are physical properties of hardened concrete?   08
b) What is curing & its significances? Explain various method of curing.   07

Q.3 a) Explain Fly Ash & Rise Husk Ash.   08
b) Explain accelerators & retarders admixtures?   07

Q.4 a) Explain importance of water cement ratio and strength of concrete?   08
b) What is non-destructive testing? Explain ultrasonic pulse Velocity.   07

Q.5 Write a short note on (<u>any three</u>)   15
a) Principles of design of Formwork
b) Initial & find setting time importance & why they are necessary
c) Workability of concrete
d) Slump test on concrete
e) Pull out test

1

Section B

Q.6   Answer the following questions (<u>Any five</u>)   10
     a)   What is light & heavy density concrete?
     b)   What is mix design of concrete?
     c)   What is aerated concrete?
     d)   Enlist various waste materials use in concrete.
     e)   What is the light weight concrete; material used?
     f)   What is the pumping if concrete?
     g)   What is the high performance concrete?
     h)   What are the types of fibers?
     i)   What are joints in concrete?
     j)   Define permeability & durability.

Q.7   Design a concrete mix of grade M35 to suit following data as per IS 10262   15
     i.   Type of cement OPC 53 grade
     ii.   Specific gravity of cement-3.15
     iii.   Max nominal size of aggregate-20mm
     iv.   Types of aggregates-crushed angular aggregates
     v.   Min. cement content $-320 kg/m^3$
     vi.   Water cement ratio- 0.45
     vii. Workability : 125 mm slump
     viii. Method of concrete placing-pumping
     ix.   Max. cement content-450 kg/m^3
     x.   Chemical Admixture type – Plasticizers
     xi.   Sp. Gravity of C.A. 2.8
     xii. Sp. Gravity of F.A. 2.6
     xiii. Water absorption : Coarse agg – 0.5%
                          Fine agg. – 1.25%

Q.8   a)   What is fiber reinforced concrete? Explain in detail different types of fibers?   08
     b)   What is light weight concrete? Explain the application of light weight concrete?   07

Q.9   a)   What are permeability, durability and chemical attack on concrete explain?   08
     b)   What does it mean by strength, mean strength, variance, standard deviation & coefficient of   07
         variance in Mix design?

Q.10 Write a short note on (<u>Any three</u>)   15
     a)   Pumping concrete
     b)   Factors affecting corrosion of concrete
     c)   Self-compacting concrete
     d)   Core test of concrete
     e)   Transit Mixer

2

Table 1: maximum water content per Cubic Meter Concrete for Nominal Max. Size of Aggregates (25 to 50 mm slump)

Sr. No.	Nominal Max. Size of Aggregates (mm)	Max. Water Content (kg)
i.	10	208
ii.	20	186
iii.	40	165

Table 2: volume of coarse Aggregates per unit Vol. of Total Aggregates for different Zones of Fine Aggregates

Sr. No.	Nominal Max. Size of Aggregates (mm)	Vol. of Coarse Aggregates per Unit volume of total Aggregates for Different Zones of Fine Aggregates			
		Zone IV	Zone III	Zone II	Zone I
i.	10	0.50	0.48	0.46	0.44
ii.	20	0.66	0.64	0.62	0.60
iii.	40	0.75	0.73	0.71	0.69

3

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-202
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Surveying - II
(OLD)

[Time: Three Hours]   [Max. Marks: 80]

Please check whether you have got the right question paper.

N.B
1. Solve any two questions from Q.No.2 to 5 and any two from Q.No.7 to 10.
2. Q.No.1 and Q.No.6 are compulsory.
3. Figures to right indicate the maximum marks.
4. Assume suitable data, if any.
5. Non-programmable calculator is allowed.

Section A

Q.1   Answer the following questions: (any five)   10
  a) Define setting out of the building?
  b) State different methods of correlates?
  c) What do you mean by signals and towers?
  d) What is meant by eccentricity of signal?
  e) Enlist various types of signals?
  f) What is meant by base net?
  g) Enlist different types of Engineering Survey?

Q.2   a) Find the most probable values of the angles A and B from the following observation of station 08
           O
           $A = 9°50'38''$ weight 2
           $B = 54°39'50''$ weight 3
           $A + B = 104°4'^130''$ weight 4

        b) What is meant by a satellite station and reduction to center? Derive expression for reducing   07
           the angles measured at the satellite station to center?

Q.3   a) The following values were recorded for a triangle ABC the individual measurement being   08
           uniformly precise.
           $A = 62°29'18''$: 6 observations
           $B = 56°45'38''$: 8 observations
           $C = 60°46'52''$: 6 observations
           Find the correct values of the angles?

        b) Write step by step procedure of setting out of culverts?   07

Q.4   a) State and explain Laws of weights.   08
        b) Explain computation of sides of a spherical triangle.   07

1

H-202

Q.5   Write a short notes on: (any three)   15
      a) Weights of observation and conditioned quantity
      b) Differentiation between setting out of the building & setting out of the culvert
      c) Weisbach triangle
      d) Differentiate between Geodetic surveying and plane table surveying.

Section B

Q.6   Answer the following questions: (any five)   10
      a) What are different types of vertical curves?
      b) Explain the principle of EDM?
      c) Enlist different types of trigonometrical leveling?
      d) What is the Geodemeter?
      e) What is meant by ideal transition curves?
      f) Enlist the element of simple circular curve mathematically?
      g) How to find out the tangent length of simple circular curve?

Q.7   a) What is trignometrical leveling? How to get level on steep ground? Explain in brief with neat   08
          sketch?

      b) Find the elevation of the top of a Chimney from following data: 07

Inst. Stations	Reading on B.M.	Angle of Elevation	Remarks
A	0.862	18°36′	R.L. of B.M. = 421.380m
B	1.222	10°12′	Distance AB = 50m

      Stations A and B and the top of the Chimney are in the same vertical plane.

Q.8   a) Two tangents AB & BC intersect at a point B at a chainage 150m. Calculate all necessary data   08
          for setting out of a circular curve of radius 100m & deflection angle $30°$ by the method of
          offsets from the chord produced?

      b) Derive the equations of simple circular curve by using the method of offsets from the long   07
          chord?

Q.9   a) Enlist different types of electronic distance measurement instruments? Explain the   08
          Geodemeter and the Distomat?

      b) State the properties of electromagnetic waves?   07

Q.10   Write a short notes on: (any three)   15
      a) Difference in between simple circular curve & compound curve
      b) EDM
      c) Reverse curve
      d) Axis signal corrections

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-201
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Surveying - II
[REVISED]

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
1) Question No.1 and 06 are compulsory.
2) Solve any two questions from remaining questions from each section.
3) Figure to right indicates full marks.

Section A

Q.1   Attempt the following (any five)   10

a) What do you mean by base line in triangulation?
b) How the marking of stations is done in triangulation?
c) What is principle of triangulation?
d) Give the statement for theory of least square.
e) Give the methods for designates the curve.
f) Enlist the linear methods to plot the curve.
g) Differentiate between point of curve and point of tangency.

Q.2   a) Explain the field procedure for setting out curve by offset from chord produced.   07

b) Two tangents meet at chainage 1012m, deflection angle being 38° . A circular curve of   08
radius 300m is introduced in between them calculates.
i.   Tangent Length
ii.   Length of circular curve
iii.   Chainage of tangent points.
iv.   Deflection angles for setting out first three pegs and last peg on curve (peg interval
is 20m)

Q.3   a) What is satellite station? Give the expression for reduction to Centre.   08

b) What are the rules to distribute weight and error in field observation?   07

Q.4   a) Explain the different methods of calculating the length of a transition curve.   08

b) A transition curve is to be used at each end of circular curve having radius of 396m, speed   07
of vehicle is 70km/ hr and width of road is 12m. If rate of change of radial acceleration is
$0.3 m/sec^3$. Calculate suitable length for transition curve and super elevation.

1

H-201

Q.5   Write a short note on (any three)   15

         a) Setting out a bridge
         b) Reverse curve
         c) Route Survey
         d) Super elevation

Section B

Q.6   Solve (any five)   10

         a) Differentiate between EDM and total station
         b) What are the uses of aerial photograph?
         c) What is principle of terrestrial photogrammetry?
         d) Enlist equipment needed for sounding.
         e) Give the four uses of hydrographic surveying.
         f) What do you mean by GIS?

Q.7   a) Define:-   07
            a. Principle point
            b. Plumb point
            c. ISO Centre, and
            d. Principal line on an air photograph. Deduce an expression for height distortion and show that tilt – distortion is radial from the isocentre.

         b) A vertical photo graph was taken at an altitude of 1150m above mean sea level. Determine 08 the scale of photograph for terrain lying at elevations of 80m and 300m if focal length of camera is 15cm.

Q.8   a) Explain key components of GIS.   08

         b) Explain electromagnetic spectrum in remote sensing.   07

Q.9   a) What are the elements of visual interpretation?   07

         b) Explain briefly the aspects of flight planning for an aerial survey.   08

Q.10   Write a short note on (any three)   15

         a) Principle of EDM
         b) Application of GIS in town planning and transportation
         c) Vector Data in GIS
         d) Method of locating sounding (any one)
         e) Scale of vertical photograph

3

Total No. of Printed Pages:03

SUBJECT CODE NO:- H-520
FACULTY OF SCIENCE AND TECHNOLOGY
T.E.(CIVIL)
Theory Of Structures-II
(REVISED)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.
N.B
1) Question No. 1 & 6 are compulsory.
2) Attempt any two questions from remaining each section.
3) Assume suitable data if necessary & state it clearly.

Section A

Q.1   Answer the following (Any Two)   10
  a) Derive slope deflection equation.
  b) What are the assumption made is plastic theory?
  c) Explain static & kinematic in determinacy of rigid plane frame & pin joined frames with
   suitable examples.

Q.2   Analyze the continuous beam show in fig. 1 using slope deflection method. E1 is constant and   15
  draw BMD.
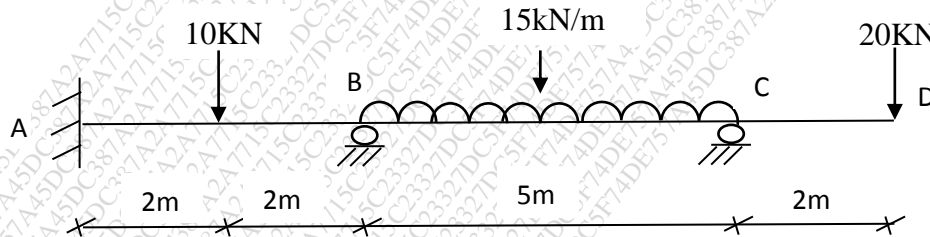
Fig. 1

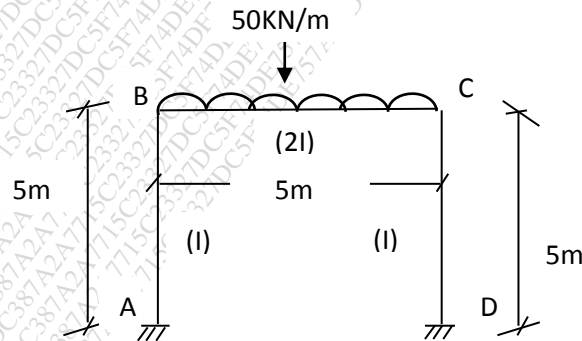Q.3   Analyze the portal frame shows in fig. 2 by using column analogy method and draw BMD.   15

Fig. 2

1

57A45DC387A2A7715C23327DC5F74DE7

Q.4   Analyze the pin joined redundant truss as shown in fig. 3 take EI=constant   15
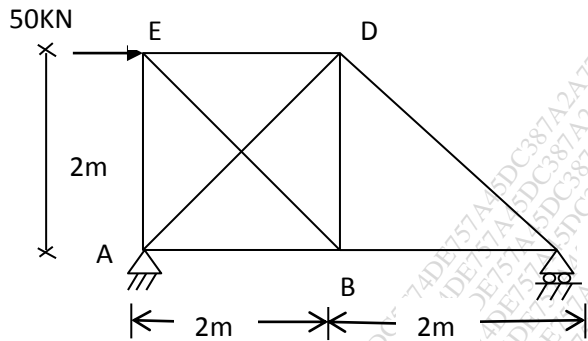
50KN

Fig. 3

Q.5   Answer the following   15
   a) Differentiate between rigid joined plane frames & pin joined plane frames.
   b) What is difference between plastic hinge & mechanical hinge?
   c) Write a note on shape factor and find shape factor for circle of diameter D.

Section B

Q.6   A) Answer the following (Any Two)   06
   a) Explain effect of shortening of rib on two hinged arch.
   b) Define distribution factor & rotation factor.
   c) State moment distribution method.

   B) Write a short note on sway analysis of frames using moment distribution method.   04

Q.7   Analyze the continuous beam shown in fig. 4& by using moment distribution method if support 15
B sinks by 5mm. Take E=200KN/mm^2, I=3.5$\times 10^7 mm^4$ and draw BMD.
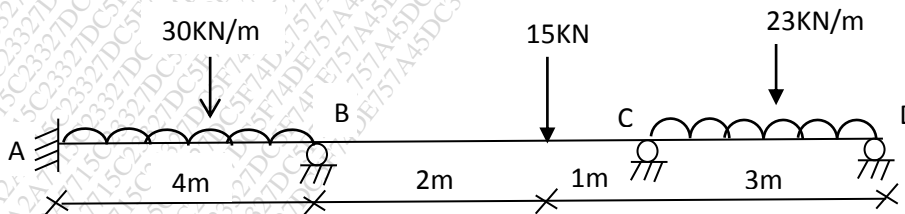

Fig. 4

2

Q.8   Analyze the portal frame shown in fig.5 by using Kani's method and draw BMD.   15
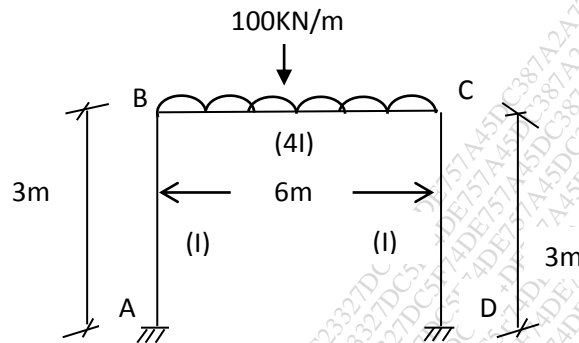

Fig. 5

Q.9   Analyze the portal frame shown in fig. 6 by using moment distribution method & draw BMD.   15
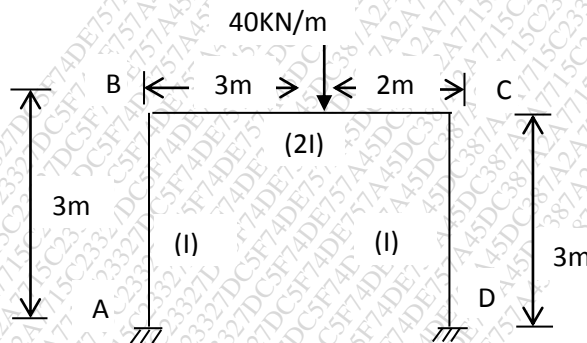

Fig. 6

Q.10   A two hinged parabolic area of span 20m and rise 4m carries uniformly distributed load of 50   15
        KN/m on left half of span of arch. Find the reaction at the supports & position and amount of
        maximum bending moment.

Examination NOV/DEC 2018

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-541
FACULTY OF SCIENCE AND TECHNOLOGY
T.E.(CIVIL)
Engineering Geology
(REVISED)

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1) Q. No. 1 is compulsory and solve any two from remaining questions from Section A.
2) Q. No. 6 is compulsory and solve any two from remaining questions from Section B.
3) Neat and labelled diagrams must be drawn wherever necessary.

Section A

Q.1 Write short notes on (Any five) 10

1) Aphanitic texture
2) Meta Somatism
3) Cleavage
4) Schistose Structure
5) Organic Deposition
6) Strike and Dip

Q.2 a) Define mineral and Describe physical properties of minerals. 08
b) Explain kinds of metamorphism. 07

Q.3 a) What is Fault? Explain Normal and Reverse Fault. 08
b) Describe physiographic divisions of India. 07

Q.4 a) What is volcano? Explain types of volcano. 08
b) Describe classification of sedimentary rock. 07

Q.5 a) Explain the kinds of metamorphism. 08
b) Define Unconformity and explain its types. 07

Section B

Q.6 Write short notes on (Any five) 10

1) Silting of Reservoirs
2) Artesian Well
3) Connate Water
4) Cone of depression
5) Dykes of Deccan trap
6) Over break

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Q.7	a)	Explain the importance of structural geology in Civil Engineering.	08
	b)	Explain the Deccan trap system with reference to classification and distribution.	07
Q.8	a)	What is Exploratory drilling? What are the advantages of drilling?	08
	b)	Explain various types of Basalts and discuss field characteristics of each type.	07
Q.9	a)	What is Rain Water Harvesting? Explain in detail its significance.	08
	b)	What difficulties will have to face if:	07
		i) A tunnel is driven through compact Basalt	
		ii) Dams on downstream dipping strata.	
Q.10	a)	What is landslide? Describe measures to be taken for prevention of Landslides.	08
	b)	Describe in detail zonal distribution of subsurface water.	07

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-548
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (CIVIL)
Highway Engineering
(Revised)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
1) Solve any three from each Section.
2) Question no.02 and 07 are compulsory.
3) Non-Programmable calculator is allowed.
4) Figure to right indicates full marks.

Section A

Q.1   The speed of Overtaking and overtaken vehicles are at 75 and 45 kmph respectively. Find   15
   i)   Overtaking sight distance
   ii)   Min. and desirable length of overtaking zone
   iii)   Show the sketch of overtaking zone with location of sign post
          (hint: acceleration=1 m/sec2)

Q.2   A national highway passing through rolling terrain in heavy rainfall area has a horizontal curve   10
         of radius 500m. Design the length of transition curve assume design speed as 70 kmph.

Q.3   a)   There is a horizontal highway curve of radius 420 m and length 200m on this highway.   08
              Compute the setback distance required from the Centre line on the inner side of the curve
              so as to provide for
              i)   Stopping sight distance of 90m.
              ii)   Safe overtaking sight distance of 300m
                     The Distance between the Centre line of road and the inner lane is 1.9m

         b)   Explain impact value test of aggregate.   07

Q.4   a)   Explain flakiness and elongation index test of aggregate.   08

         b)   A valley curve is formed by a descending grade of 1 in 25 meeting an ascending grade of   07
              1 in 30. Design the length of valley curve to fulfill both comfort condition and headlight
              sight distance requirements for a design speed of 80kmph. Assume allowable rate of
              change of centrifugal acceleration C=0.6 m/sec^3

Q.5   Explain Marshall mix design procedure for bituminous mix design in detail.   15

1

Section B

| Q.6 | Discuss various factors to be considered for the design of pavements in detail. | 15 |

Q.7　What are the various types failures in flexible pavement? Explain the causes?　　10

Q.8　a)　What are the various types of special repair in flexible pavement.　　08

　　　b)　State the functional classes of traffic signs with example.　　07

Q.9　a)　Explain different road user characteristics and vehicular characteristics which affect the　08
　　　　　road design.

　　　b)　State the functional classes of traffic signs with example.　　07

Q.10　Discuss the object of the following types of joints (any three) draw neat sketches.　　15

　　　a)　Expansion joint
　　　b)　Contraction joint
　　　c)　Warping joint
　　　d)　Longitudinal joint

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-534
FACULTY OF SCIENCE AND TECHNOLOGY
T.E.(CIVIL)
Building Planning And Design
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
1. **Q. No.1** and **Q.No.6** are compulsory.
2. Attempt any **Two** questions remaining from section-A.
3. Attempt any **One** questions remaining from section-B.
4. Assume suitable data if necessary.
5. Use drawing sheet for **Q.No.6** of Section-B.
6. Figures to the right indicate full marks.

Section: A

Q.1   Attempt any five questions from the following   10

1. What is the Control Line?
2. What is the Semi-Detached Building?
3. What is the Drain?
4. What is the Set-back Line?
5. What is the difference between house and home?
6. What is mean by Sewage and Sullage?
7. Define Mezzanine floor.

Q.2   a) What is a Sun patch diagram? Give the C.B.R.I. recommendations for obtaining Optimum   08
           orientations of building.
           b) Explain the building bye-laws with reference to   07
           i.   Open space requirement
           ii.   Height limitation
           iii.   Plinth area regulation

Q.3   a) What are the Principles of Thermal Insulation? Discuss with different Materials.   08
           b) What is mean by Structural Audit of Buildings? Write down the Stages in Carrying out   07
           Structural Audit.

Q.4   a) Enlist the Causes of failure of house drainage system (water seal). Write down   08
           Classification of traps used in plumbing system with its function.
           b) State various Building services. Which services are essential for planning a commercial   07
           building consisting of shops, bank and offices?

Q.5   a) What are the different types of flooring? Explain Concrete Flooring with Procedure   08
           (Tremix Flooring).
           b) Write down the Concept of earthing. Explain in detail Electrification and its type.   07

1

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Section: B

Q.6 Plan and design a residential building for a family in new Aurangabad using the following data.
(Draw with suitable Scale)
- a) Plot Size 10 m X 15 m.
- b) Requirement: Ent. Varandha, Living room, Kitchen cum dinning, Store room, Bed room, Master Bed Room, Separate W.C. Bath and Stair Case.
- c) Front, Back & Side margin as per NBC -2005.
  - i. Working Drawing plan   08
  - ii. Elevation   03
  - iii. Locate Position of Column in plan   03
  - iv. Section through Stair.   06
  - v. Area Statement (Block plan calculation)   05

Q.7
- a) List out the requirement with minimum standards specified by building Bye-law of Health 08 care building and Draw Line plan Layout.
- b) How do you achieve roominess, functional planning and flexibility in a Building? Explain 07 with Example.

Q.8
- a) How are the perspective projections classified? Mention the practical application of each 08 type of perspective projections.
- b) Write a note on landscaping types and their materials.   07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-527
FACULTY OF SCIENCE AND TECHNOLOGY
T.E.(CIVIL)
Design Of Structure-I (Steel)
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B   i) Question No.1 from section A and Q. No.6 from section B are compulsory. Attempt
           any two questions of each section from the remaining.
           ii) Assume suitable data if required & mention it clearly.
           iii) Use of nonprogrammable calculators, IS 800-2007 is permitted.

Section A

Q.1   Attempt any five.   10
        a) Enlist structural steel section.
        b) What is classification of structural members?
        c) What is limit state method?
        d) What is pitch and edge distance?
        e) What is shear lag?
        f) What is effective length?
        g) What is lacing and battening?

Q.2   a) Design the lap joint between plates of sizes 100×16 mm thick and 100×10 mm thick so   08
            as to transmit a factored load of 100 kN using single row of bolts of grade 4.6 and grade
            410 plate.
            Assume e = 30 mm and area of bolt = 157 mm^2

        b) Write the procedure steps for welded connection.   07

Q.3   An equal angle 2.2 m long of a truss is connected the gusset plate, it carries ultimate tension of   15
        120 KN. Design section using 6 mm weld. and Fy = 250 N/mm^2 and Fe 410 for plate.

Q.4   A double angle discontinuous strut is to carry factored load of 275 kN. The length of strut   15
        between intersections is 2.7m. The angles are tack bolted throughout the length. Design the
        section with
        a) angles placed back to back on opposite side of gusset plate.
        b) angles placed back to back on same side of gusset plate.
        Assume F_y = 250 MPa.

Q.5   Design battened column 8 m long to carry a factor load of 1800 KN. The column is effectively   15
        held in position at both ends and restrained against rotation at one end. Providing double lacing
        system and used two channels back to back.
        Used Fy 250 N/mm^2.

1

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Section B

Q.6   Attempt any five.   10
      a) Explain failure modes of beams.
      b) Explain local bucking of flange.
      c) What is plate girder?
      d) What is laterally unsupported beam?
      e) What are the different load considering in the design of roof truss.
      f) Define Girder and Stringer.
      g) Enlist different types of steel structures.

Q.7   A simply supported steel joist of 4 m effective span laterally supported through out. It carries a   15
total udl of 50 kN/m (Inclusive of self-weight). Determine an appropriate section using steel
grade of Fe410.

Q.8   Design the plate girder for an effective span of 40 m and carrying a udl of 35 KN/m and two   15
concentrated load of 100 KN each acting at 10 m from both ends. The girder is simply supported
at ends against lateral buckling throughout span.
Take Fy = 250 N/mm^2

Q.9   A 10 × 60 m building is to be constructed the steel roof truss will be used for roofing. GI sheets   15
are used as roofing material. Suggest suitable type of roof truss. The basic wind pressure is 1000
N/m^2. Determine dead load, Live load, Wind load on each point.

Q.10   Write short notes on
      a) Explain unrestrained beams.   05
      b) What are various section of plate girder?   05
      c) Draw the sketches of various trusses and state its suitability for span.   05