

Total No. of Printed Pages:2

**SUBJECT CODE NO:- H-498**  
**FACULTY OF ENGINEERING 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) Solve any three questions from each section.
  - ii) Figures to the right indicate full marks.
  - iii) Assume suitable data if necessary.

**Section A**

- |     |   |    |
|-----|---|----|
| Q.1 | a) What are the significant recommendations of Jayakar Committee Report? Mention how this helped in road development in India.  | 08 |
|     | b) Briefly explain the engineering Surveys needed for locating a new highways.  | 08 |
| Q.2 | a) Briefly explain geometric design of highway.   | 08 |
|     | b) Calculate the minimum sight distance required to avoid a head on collision of two cars approaching from the opposite directions at 90 to 60 Kmph. Assume reaction time 2.5 seconds, coefficient of friction of 0.7 & Brake efficiency of 50 percent. | 08 |
| Q.3 | a) Enlist various test on road aggregates. Explain in detail any one test with neat sketch.   | 08 |
|     | b) Explain with neat Sketch Construction of Cement Concrete road and their properties.  | 08 |
| Q.4 | a) Explain group index method of pavement design. What are the limitation of this method?   | 08 |
|     | b) Discuss the advantages and limitations of CBR method of design.  | 08 |
| Q.5 | Write a Notes on Following (any three)  | 18 |
|     | i) IRC-37-2001.   |    |
|     | ii) IRC-58-2002.  |    |
|     | iii) Highway Financing  |    |
|     | iv) Set back distances.   |    |

**Section B**

- |     |   |    |
|-----|---|----|
| Q.6 | a) Enlist the types of pavement Construction? Explain construction of soil stabilized roads.                      | 08 |
|     | b) Write general causes of pavement failure? Explain classification of maintenance works.                         | 08 |
| Q.7 | a) Explain how the speed and delay studies are carried out. What are the various uses of speed and delay studies? | 08 |
|     | b) With neat sketches show various types of traffic signs and what are advantages of traffic signals.             | 08 |

- Q.8 (a) What is runway orientation? What are the various factors govern the design of runway. 08  
(b) Explain in detail air traffic control devices. 08
- Q.9 (a) Estimate the basic capacity of traffic lane at a speed of 60 Kmph. Assume that all the vehicles are of average length 6m. 08  
(b) Explain the traffic manoeuvres and their applications. 08
- Q.10 Write Notes on following (any three) 18  
i) Ventilation and drainage in tunnel  
ii) Problems in tunnel construction  
iii) Air travel demand Forecast  
iv) Cause of pavement Failures

Total No. of Printed Pages:2

**SUBJECT CODE NO:- H-146**  
**FACULTY OF ENGINEERING 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) Explain the role of construction industry in national development. 06
- Q.2 a) Explain in brief various parts of dragline with sketch. 07  
 b) Describe the term project monitoring and control. 07
- Q.3 Tables gives the information about various activities of network shown in below given table. draw the network and compute early start time, early finish time, latest start time, latest finish time and total float. 13

Activity	1-2	1-3	2-4	2-5	3-5	3-6	4-7	5-7	6-7
Duration	7	3	10	5	3	5	7	10	5

- Q.4 a) Distinguish between PERT and CPM. 07  
 b) Discuss time estimate in PERT. 06
- Q.5 Write short notes on any three 12
- i) Hydraulic Excavator
  - ii) Cost Optimization
  - iii) Work break down Structure
  - iv) Feasibility Studies

**Section B**

- Q.6 a) Enlist the different investment Criteria method? Explain any one in detail. 07  
 b) Explain Fixed Capital and Working Capital. 07
- Q.7 a) Describe in details tools used for safety in construction project. 07  
 b) Explain Wage Structure. 06
- Q.8 a) Explain the term Downward and Horizontal communication. 06  
 b) Distinguish between Oral and written communication. Mention under which circumstances each is used. 07

- Q.9 a) Explain in detail “Economic Order Quantity” 07
- b) A factory uses two pieces per day of a rod 6mm in diameter of 150mm long in one of their manufacturing processes. The rod cost Rs 3 each and the total expenses involved in purchasing and receiving them are Rs 50. Ordering the annual inventory carrying cost per item is Rs 1. The procurement period is 3 days and minimum stock kept is 8 pieces. Determine: 06
- Standard ordering quantity
  - Reorder point
  - Maximum Stock

- Q.10 Write short notes on any three 12
- Net Present Value
  - ABC Analysis
  - Microsoft Project Planning
  - Manpower management in Construction Industry

Total No. of Printed Pages:03

**SUBJECT CODE NO:- H-113**  
**FACULTY OF ENGINEERING 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

1. Questions no.1 and question no.6 are compulsory
2. Solve any two questions from question no.2 to 5 any two from question no.7 to 10
3. Figures to right indicate the maximum marks.
4. Use of non- programmable calculator is permitted
5. Assume suitable data if necessary and mention it clearly

## Section A

- Q.1 Any two 10
- a) What is difference in between rectangular plate and circular plate?
  - b) What is difference in between thin plate and thick plate?
  - c) State the assumptions in Kirchhoff's thin plate theory.

- Q.2 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.3 a) Explain plane strain problem and plain stress problem 08

- b) The strain components at a point in a body subjected to two dimensional state of stress are given by 07

$$\epsilon_{xx} = 2x^3 + x^2y^2 - z^2 - 3$$

$$\epsilon_{yy} = 4y^3 + x^3z^2 + y^2 - 6$$

$$\epsilon_{zz} = 4y^4 + 3x^2y^2 + xz^3 - 6y^3$$

$$\gamma_{xy} = 5x^3y^2, \gamma_{yz} = 5y^2, \gamma_{xz} = x^2z^2$$

Determine the state of stress at point (-2 , 3, 1). Use  $E = 2 \times 10^5 \text{ MPa}$  &  $\mu = 0.25$

- Q.4 a) Derive governing differential equations of equilibrium for a two dimensional state of stress in static condition. 08

- b) Given the following system of strains 07

$$\epsilon_x = x^2y + y^2x^3 - xy^4 + y^3 - 15$$

$$\epsilon_y = x^2 + xy^3 - xy^5 - y^2 - 06$$

$$\gamma_{xy} = 5y (x^3 + y^4 - 5x - 5y) + 11$$

$$\epsilon_z = \gamma_{zx} = \gamma_{zy} = 0$$

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

Section – B

- Q.6 Any two 10
- a) What is difference in between flexibility matrix method and stiffness matrix method?
  - b) What is difference in between plates and shells?
  - c) What is difference in between membrane theory and bending theory of shells?
- Q.7 a) Explain static indeterminacy and dynamic indeterminacy? 08  
 b) Write down stepwise procedure adopted in finite element method of structural analysis? 07
- Q.8 a) Derive equilibrium equations for spherical shell as membrane theory? 08  
 b) Draw Pascal's triangle? 07
- Q.9 Draw the BMD of the continuous beam shown in fig.1 by stiffness matrix method. 15

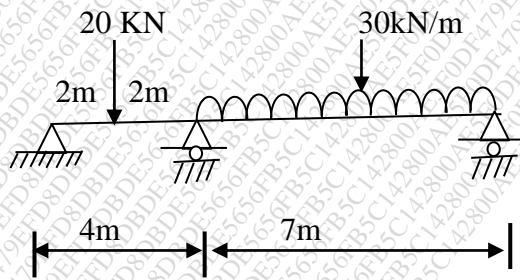


Fig no. 1

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

15

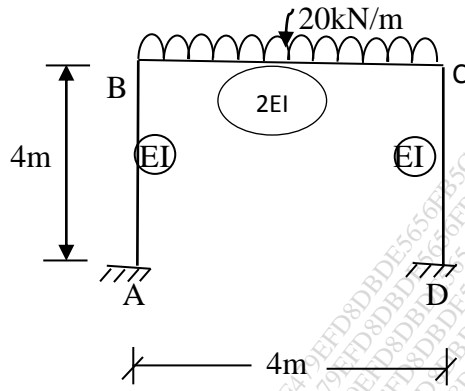


Fig no .2

Total No. of Printed Pages:2

**SUBJECT CODE NO:- H-219**  
**FACULTY OF ENGINEERING 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 any two questions among the remaining questions (i.e 2 to 5 ) of section A and any 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<br>a) Name various biological pollutants<br>b) Complete the following reactions $\text{HCl} + \text{NaOH} \longrightarrow \text{-----} + \text{-----}$<br>c) What are golden principles of waste Minimization<br>d) What is aim of waste Hierarchy<br>e) Define EIA   | 10           |
| Q.2 | a) State the importance of water pollution control Acts<br><br>b) Explain in detail Whipple ecological model   | 07<br><br>08 |
| Q.3 | a) The sewage of a town is to be discharged into a river stream. The quantity of sewage produced per day is 8 million liters, and its BOD is 250mg/L if the discharge in the river is 200L/S if its BOD is 6 mg/L find out the BOD of diluted water. Also what should be the river discharge if it is desired to reduce the BOD of diluted water to 20mg/L<br><br>b) State importance and Necessity of Equalization and Neutralization | 07<br><br>08 |
| Q.4 | a) Explain process change & Equipment Modification ways of strength reduction of waste in industries<br><br>a) What is importance of EIA explain in detail   | 07<br><br>08 |
| Q.5 | Write short notes on ( any three)<br>b) Physical and chemical pollutant associated with stream pollution<br>c) Functions & Responsibilities of state pollution control Boards<br>d) Utility of EIA<br>e) Environmental inventory   | 15           |



Section – B

- Q.6 Answer the following questions 10
- a) What is granulated sugar
  - b) Define TCD, in line with sugar industry
  - c) What in Tanning
  - d) Influent BOD of wastewater entering into specific treatment is 400mg/L and effluent BOD of wastewater coming out is 40mg/L what is efficiency of that specific treatment
  - e) What is OLR state formula for OLR
- Q.7 a) Explain characterization of waste associated with sugar industry 08  
 b) What are various processes carried out in paper and pulp industry 07
- Q.8 a) Enlist and explain design parameters of ASP 08  
 b) Design oxidation pond for treating sewage from a hot climatic residential colony with 5000 persons contributing sewage @ 120 LPCD and BOD<sub>5</sub> of sewage is 300mg/L 07
- Q.9 a) List out and explain various Environmental impacts of Radioactive waste 08  
 b) Explain various disposal method of industrial waste 07
- Q.10 Write short notes on ( any 3) 15
- a) Air stripping
  - b) Electrodialysis
  - c) UASBR
  - d) Distillery industry

Total No. of Printed Pages:02

**SUBJECT CODE NO:- H-216**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**B.E. (Civil)**  
**Elective-II**  
**Advanced Structures**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks:80]

N.B Please check whether you have got the right question paper.

- N.B
- 1) Solve any two question 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 Fig.1 shows a layout of column's of building. The outer column are 600×900mm in size & carry a load of 700 KN each. The inner column are 450×450 mm in size & carries a load of 800KN each. In addition to this it is subjected to moment at 1000KN-m due to wind load acting along the length of building & SBC of soil is 100 KN/m<sup>2</sup>. Use M<sub>20</sub> & Fe<sub>415</sub>. Design the following

- 1) Slab
- 2) Secondary beam BE
- 3) Calculate the loading on the main beam ABC

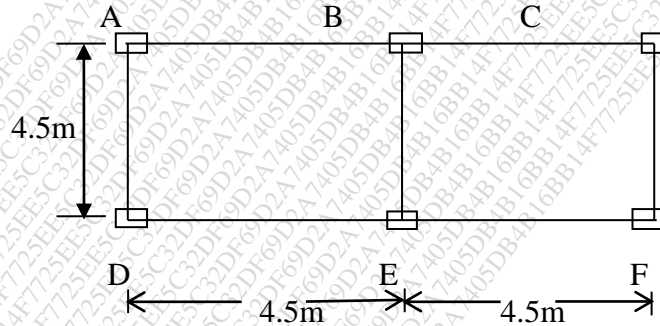


Fig.1

Q.2 a) Explain design procedure of pile in detail with all types of stresses. 08  
 b) A.R.C. column 400×400 mm carrying a load of 700 KN is supported on three piles. 400×400 mm in section. The Centre to Centre distance between piles is 1.5m. Design suitable pile cap. use M<sub>20</sub> & Fe<sub>415</sub>. Show reinforcement details. 12

Q.3 A cylindrical water tank is 6.5m in diameter. contains water upto a height of 3m excluding free board. Tank rests on a ring beam at a bottom 6.5m diameter. Dead weight of all components of water excluding water load transferred to ring beam is 40 KN/m. design the ring beam. Use free board 0.2m. Use M<sub>20</sub> & Fe<sub>415</sub>. The ring beam is supported by 8 symmetrically placed columns. 20

No.of columns	2φ	β <sub>s</sub>	β <sub>m</sub>	β <sub>T</sub>	θ
8	45	0.066	0.033	0.005	9.5°

## Section B

- Q.4 a) Explain the different load calculations in the transmission tower for a panel. 08  
 b) Explain following terms with reference to bridges 12  
 1) IRC loading  
 2) Ground contract area  
 3) Dispersion of load long span  
 4) Distribution of wheel load on slab
- Q.5 a) What are the different types of folded plates, there components & action & assumption made in analysis of folded plates? 12  
 b) Derive the relation for edge shear in folded plates. 08
- Q.6 a) Compare the design of deep beam by IS code & British code. 08  
 b) A reinforced concrete deep girder is continuous over span of 9 m. apart from Centre to Centre. It is 4m deep & 300mm thick. The column are 900mm in width. If the girder support's a uniformly distributed load of 200KN/m including its own weight. Design the beam. Use  $M_{20}$  &  $Fe_{415}$  steel. Show reinforcement details. 12

Total No. of Printed Pages:02

**SUBJECT CODE NO:- H-303**  
**FACULTY OF ENGINEERING 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) Domestic sewage
    - ii) Industrial sewage
  - b) Permissible limit for disposal on land
    - i) COD
    - ii) BOD
  - c) Define "sludge buckling".
  - d) What is self-cleaning velocity?
  - e) Limitation of BOD.
  - f) List of various constituents of waste water.
- Q.2 07
- a) Explain importance of analysis of sewage in sewage treatment.
  - b) Design an outfall sewer of separate system for a town with population of 1,50,000 08  
 persons with water supply of 180 lpcd. The sewer has to be of Brickwork rendered smooth with cement mortar. ( $N=0.012$  and permissible slope is 1 in 1000) a self-cleaning velocity of 0.75 m/sec has to be developed. Take D.W.F. = 1/3 of max of discharge.
- Q.3 07
- a) Define self-purification of stream and explain factor affecting self-purification of stream.
  - b) Design a bar screen chamber for avg. flow of 209 mld. min sewage flow 12 mld and max 08 flow of 30 mld. Angle of inclination of bar screen with horizontal =  $30^\circ$ . Assume size of bar is  $9\text{mm} \times 50\text{mm}$  with 9mm facing the flow. A clear spacing of bar is 30mm. velocity of flow normal to screen 0.3 m/s at avg. flow.
- Q.4 07
- a) A sample of waste water has 4 days  $20^\circ\text{C}$  BOD value 75% of final. Find the rate constant (to the base 10) per day.
  - b) State the effluent standard for disposal of waste water on land, river and irrigation. 08

- Q.5 Write short note (any three) 15
- 1) 1<sup>st</sup> stage and 2<sup>st</sup> stage BOD
  - 2) Grit chamber
  - 3) Slamming tank
  - 4) Sewage pumping
  - 5) COD

Section B

- Q.6 a) Explain how will you decide the type of treatment to be given to a sewage. 05  
 b) Define 05
- i) Aerobic
  - ii) Anaerobic
  - iii) TOD
- Q.7 a) Explain with flow diagram. The essentials of activated sludge process. 07  
 b) Design a convertical activated sludge plant. 08
- i) Population = 1,20, 000
  - ii) Per capita sewage contribution = 160 lpcd
  - iii) Settled sewage BOD<sub>5</sub> = 200 mg/lit.
  - iv) Effluent BOD<sub>5</sub> required = 15 mg/lit
  - v) MCSS = 3000 mg/lit
- Q.8 a) Explain operational problems in trickling filter. 07  
 b) Calculate the diameter required for a single stage trickling filter which is to yield an effluent BOD<sub>5</sub> of 20mg/lit when treating settled domestic sewage with a BOD<sub>5</sub> of 120 mg/lit. The waste water flow is 2200 m<sup>3</sup>/day and recirculation is constant at 4000 m<sup>3</sup>/day. The filter depth is 1.5m. 08
- Q.9 a) Explain solid waste disposal method in detail. 07  
 b) Explain advantages and disadvantages of aerated lagoons with suitable example. 08
- Q.10 Write short note (any three) 15
- a) Sludge digestion process
  - b) Septic tank
  - c) UASBR
  - d) Nitration removal

Total No. of Printed Pages:2

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

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

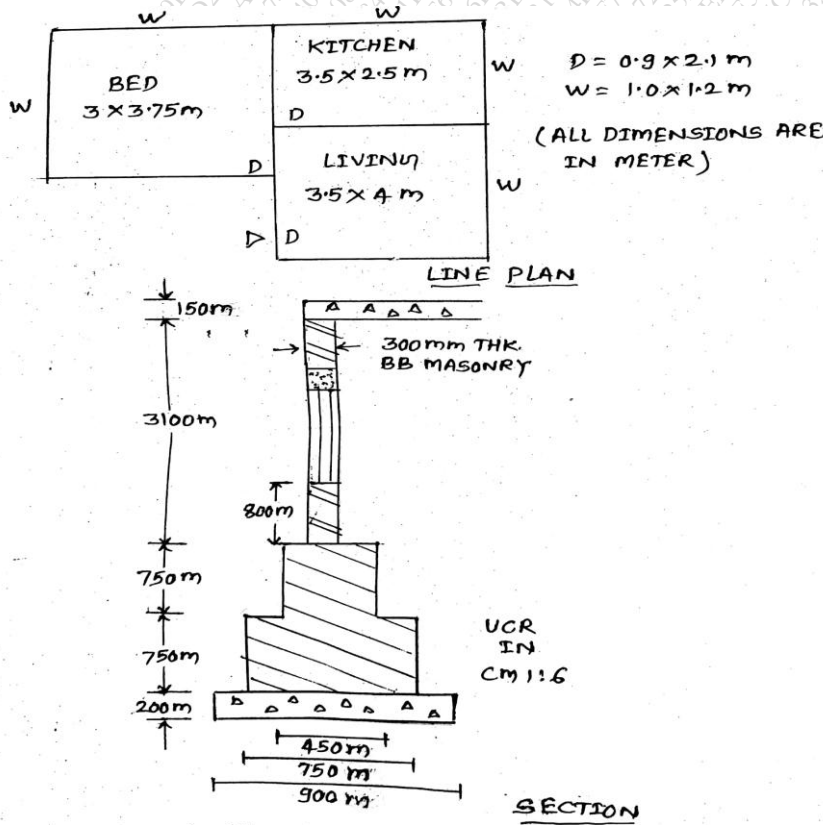
- N.B
- (i) Q. No.1 is compulsory and solves any two questions from remaining in section 'A'.
  - (ii) Attempt any three questions from Section 'B'.
  - (iii) Figures to right indicate the maximum marks
  - (iv) Assume suitable data if necessary.

Section A

Q.1 Workout the quantities of the following items from the given drawing (fig.1)

20

- (a) Excavation in soft murum for foundation trenches.
- (b) U.C.R. Masonry in C.M.(1:6) in foundations and plinth.
- (c) II<sup>nd</sup> class B.B. Masonry in C.M.(1:6) for superstructure.
- (d) 12mm thick cement plaster for internal walls and ceiling.
- (e) Mosaic tiled flooring in all rooms.



Q.2	Write detailed specification for:	
	(a) White-washing	05
	(b) Earthwork in excavation of foundation trenches.	05
Q.3	Carry out rate analysis for:	
	(a) Pointing work in C.M.(1:4)	05
	(b) U.C.R. masonry in C.M. 1:4 in foundation.	05
Q.4	Explain the following:	
	(a) Factor affecting rate analysis.	04
	(b) Prime cost and Provisional sum	04
	(c) Leads and lifts.	02
<b>SECTION –B</b>		
Q.5	Explain the following in details.	
	(a) Lump-sum contracts	02
	(b) Arbitration	04
	(c) Capitalized value	04
	(d) Scrutiny and award of tenders	04
Q.6	(a) Explain the various forms of cost-plus or percentage contacts.	07
	(b) What are the responsibilities of engineer and contractor.	06
Q.7	(a) What is property mortgaging? Explain in brief.	07
	(b) Explain the method of valuations.	06
Q.8	(a) Explain procedure for selection of tender in government works.	07
	(b) Explain the process for housing loan, E.M.I. and repayment conditions.	06
Q.9	(a) Explain building bye-laws and norms.	06
	(b) What is sale deed? Discuss its merits and demerits.	07



Total No. of Printed Pages:02

**SUBJECT CODE NO: H-406**  
**FACULTY OF ENGINEERING 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 any three questions from each section.
  - ii) Draw neat Sketches whenever required.
  - iii) Assume suitable data if necessary and state it clearly

**SECTION – A**

- Q.1 a) What is reconnaissance? What type of information is obtained in reconnaissance? What is its use? 07
- b) Explain various types of soil samplers for obtaining undisturbed samples. 06
- Q.2 a) Explain plate – load test. What are its limitation and used? 07
- b) What are the causes of settlement of foundations? Discuss their control measures also. 06
- Q.3 a) What is floating foundations? Discuss 06
- b) What do you understand by failure mechanism in soil? Explain mode of shear failure for Shallow foundation. 07
- Q.4 a) Discuss the Terzaghi's expression of bearing capacity of soil for square and circular footings. 06
- b) A strip footing 1 m wide is laid at a depth of 2m in C- $\phi$  soil having the following characteristics. Calculate  $q_f$  by Terzaghi analysis. Take the following values of bearing capacity factors:  
 Terzaghi ( $\phi=28^\circ$ ),  $N_c = 32, N_q = 18, N_\gamma = 16$ , take  $C = 20kN/m^2$ ,  $\gamma = 20kN/m^3$  and  $\phi=28^\circ$  07
- Q.5 Write short notes on 14
- a) Design procedure of combined footing
  - b) Auger Boring
  - c) Combined footing



## SECTION – B

- Q.6 a) Design a friction pile group to carry a load of 4600kN including the weight of cap. The soil is uniform clay up to a depth of 24m underlain by rock. The average unconfined compression strength of clay is  $82kN/m^2$ . 10
- b) What is cofferdams? 03
- Q.7 a) What is tilt and shift of a well? How it is rectified. 06
- b) What are the characteristic of black cotton soli and how they affect the foundation resting on it? 07
- Q.8 a) Explain the construction of cellular cofferdam 07
- b) Write short note on: 06
- i) Sand island method
- ii) Design of circular cofferdam
- Q.9 a) Discuss the design procedure of pile foundation. 07
- b) What do you understand “Foundation on difficult soils” explain with examples? 06
- Q.10 Write short note on (any three) 14
- a) Sandy island method
- b) Caisson disease
- c) Advantages of drilled pier over the pile group
- d) Negative skin friction

Total No. of Printed Pages:02

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

[Time: Three Hours]

[Max. Marks: 80]

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

**Section A**

- |     |   |          |
|-----|---|----------|
| Q.1 | Solve any three<br>a) Describe methods for waterproofing in plumbing.<br>b) Local municipal Laws relating to plumbing.<br>c) Explain drinking fountain, clothes washer, mop sink, overflows and strainers.<br>d) How to processed venting to traps?<br>e) Explain types of terminals. | 12       |
| Q.2 | a) Explain in details about methods of trenching in plumbing.<br>b) Give specification about spaces required for various sanitary facilities.   | 07<br>07 |
| Q.3 | a) What is mean by water conserving fixtures?<br>b) Explain in details about different types of plumbing fixtures.  | 07<br>07 |
| Q.4 | a) Explain in Details about clarifiers.<br>b) Describe grease interceptors  | 07<br>07 |
| Q.5 | a) What is mean by flood rim level in vents?<br>b) Give details about hot water temperature in plumbing fixtures.   | 07<br>07 |

**Section B**

- Q.6 Solve any three 12
- a) How to define multiple storage tanks for high rise buildings?
  - b) How to define sizes of pipes for sewer in buildings.
  - c) Describe various insulating materials for solar hot water system.
  - d) How to control thermal expansion for water supply Pipes in High rise buildings?
  - e) What is mean by window area way drain? Explain in Details.
- Q.7 07
- a) Explain DFU 07
  - b) Explain in Details about conductors and connections. 07
- Q.8 07
- a) Differentiate in between potable and non-potable water. 07
  - b) Explain in details about Hot and cold water distribution system in High Rise building. 07
- Q.9 07
- a) Explain fitting suitability for following pipes for building sewers. 07
    - i) RCC
    - ii) PVC
    - iii) Nu-Drain
  - b) Explain in details about rain water system in high rise buildings. 07
- Q.10 07
- a) Explain manholes in Details. 07
  - b) Explain disinfection process for water supply in high rise building. 07

Total No. of Printed Pages:2

**SUBJECT CODE NO:- H-337**  
**FACULTY OF ENGINEERING 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) Define FRL and DSL in reservoir with sketch.
  - b) Define with neat sketch overflow dam and non-overflow dam.
  - c) Draw a diagram showing principal and shear stresses, give the meaning of each term.
  - d) Define with neat sketch rock toe in earthen dam.
  - e) Draw a neat sketch of constant radius arch dam.
  - f) Define reservoir sedimentation enlist the causes of sedimentation.
  - g) Define gravity dam enlist the models of failure of gravity dam.
- Q.2 a) Explain the various investigations of site to be undertaken for water reservoir site. 08  
b) Give the classification of various types of dam. 07
- Q.3 a) A gravity dam has the following dimensions, height of dam is 100m, free board is 1.0m and 08  
Slope of up-stream face is 0.15:1. Determine hydrodynamic earthquake pressure and its moment at a joint situated 50m below maximum water surface. Take  $\alpha = 0.1$   
b) Derive an expression for the limiting height of a low dam. 07
- Q.4 a) Show that the most economical central angle of an arch based on the thin cylinder theory is 08  
 $133^{\circ}34'$ .  
b) What are the characteristics of the phreatic line? 07
- Q.5 Attempt any Three. 15
- a) Write a short note on Types of reservoirs.
  - b) Write a short note on instrumentation in gravity dam.
  - c) Explain with neat sketch uplift pressure on gravity dam.
  - d) Enlist the various methods of Embankment seepage control explain any one with neat sketch.

**Section B**

- Q.6 Attempt any Five. 10
- a) Define energy dissipation and enlist different types of energy dissipaters.
  - b) Draw a neat sketch of cross-section of canal and show all components.
  - c) Define canal fall what is the necessity of canal fall.
  - d) Define module and enlist the functions served by module.
  - e) Define divide wall and enlist the functions served by divided wall.
  - f) Define fish ladder with neat sketch.
  - g) Define spillway and enlist its types.
- Q.7 a) Explain a design procedure for the standard stilling basin type-I 07  
 b) The slope of a channel in alluvium soil is  $S = 1/5500$ , Lacey's silt factor = 0.90, side slope  $1\frac{1}{2}:1$ . 08  
 Find the channel section and maximum discharge which can be allowed to flow in it.
- Q.8 a) What is a transition? Discuss various methods for the design of transitions. 08  
 b) Explain with neat sketch 07
- i. Level crossing.
  - ii. Canal siphon.
  - iii. Syphon aqueduct.
- Q.9 a) Explain the causes of failures of weirs and their remedies. 08  
 b) Write a short note on factors influencing alignment of canals. 07
- Q.10 Attempt any Three. 15
- a) Explain with neat sketch drum gates and vertical lift gates of spillway.
  - b) What are the drawbacks in Kennedy's silt theory?
  - c) Explain with neat sketch Gibb's module.
  - d) Explain with neat sketch Dry intake tower.

Total No. of Printed Pages:2

**SUBJECT CODE NO: H-372**  
**FACULTY OF ENGINEERING 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 any two questions from section A and Section B each
  - 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 Design a trapezoidal footing for the two columns having the following data:

20

- i) Size of column A = 500mm × 400 mm
- ii) Load on column A = 1000KN
- iii) Size of column B = 500mm × 250mm
- iv) Load on column B = 600KN
- v) The column B is situated on the boundary of property line
- vi) The clear projection from the face of column A = 0.6 meter
- vii) Centre to Centre spacing between A and B= 1.7 meter
- viii) Safe bearing capacity of soil =200KN/m<sup>2</sup>
- ix) Use M-30 and fe-415 also draw the reinforcement diagrams

Q.2 a) Design interior panel of flat slab without drop of size 5.2 meter × 6.2 meter in size, supported on 15 column of 600mm in diameter. Live load= 4 KN/m<sup>2</sup> finishing surface is 20mm thick. Density of finishing surface= 24 KN/m<sup>3</sup>. Use M-20 and fe-500. Also draw the reinforcement diagrams

- b) Explain: 05
- i) Column head and its function
  - ii) Drop with diagram (labeled)
  - iii) Panel
  - iv) Column strip
  - v) Middle strip

Q.3 Design a counterfort retaining wall for the following data:

20

- i) Height of stem above ground level=8 meter
- ii) The earth fill level with top
- iii) Density of earth fill = 16 KN/m<sup>3</sup>
- iv) Angle of repose=30<sup>0</sup>
- v) Foundation depth below ground level =1.7meter
- vi) Safe bearing capacity of soil = 200 KN/m<sup>2</sup>
- vii) Spacing of counterfort= 3.2 meter centre to centre
- viii) Coefficient of friction = 0.5
- ix) Use M-25 and fe-415 Also draw the reinforcement diagrams

## Section B

- Q.4 Design an elevated rectangular water tank of capacity 30,000 liters. Design walls and base slab of water tank. Walls are fixed at base and free at top use M-25 and fe-500. Assume L/B ratio as 1.6. draw neat sketches of reinforcement detailing use IS code method
- Q.5 a) Explain Magnel blaton system of prestressing using neat sketch 05
- b) Differentiate between prestressed concrete and reinforced concrete 05
- c) A prestress concrete beam 200mm wide, 300 mm deep is prestressed with a cable, located at the constant eccentricity of 50mm carrying the initial stress of  $1000 N/mm^2$ . Span of the beam =10meter. Area of the steel = $160mm^2$ . Calculate the loss of stress
- i) If the beam is pre tensioned
- ii) If the beam is post tensioned
- Q.6 a) Design a circular slab for a room 6 meter in effective diameter, the slab is fixed at the edges and carries live load of  $4KN/m^2$ . The slab has a finishing coat of 20mm cement concrete. Density of finishing coat is  $24KN/m^3$ . Use M-30 and fe-500 also draw the reinforcement diagrams. 10
- b) Write essential requirements of form work 04
- c) Explain with neat sketches the form work used for various components such as column, beam and floor slab 06



Total No. of Printed Pages:2

**SUBJECT CODE NO:- H-446**  
**FACULTY OF ENGINEERING 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 question from the following<br>a) Duties and power of town planning officer<br>b) Satellite Town<br>c) Necessity of Town Planning<br>d) Land acquisition act 1894 | 10       |
| Q.2 | a) What are the various form of planning? Explain in detail all forms of planning?<br>b) What are the aims and objectives of Town Planning?  | 08<br>07 |
| Q.3 | a) Explain town planning in Vedic period with neat sketch.<br>b) What are the different stages in the growth of town?  | 08<br>07 |
| Q.4 | a) Explain evolution of planning legislation in India.<br>b) Explain in detail Building Bay Law.   | 08<br>07 |
| Q.5 | a) Explain impact of industrialization on town planning<br>b) Explain the first sanitary and public health act of Great Britain of 1840.   | 08<br>07 |



**Section B**

- Q.6 Write short notes on any two of the following 10
- i) Floor surface index
  - ii) Distribution of land
  - iii) Layout of Residential Area
  - iv) Ribbon Development
- Q.7 a) Explain in details various types of Zoning. 08
- b) What are the types of survey? Explain town survey in detail. 07
- Q.8 a) What is traffic management? Explain different type of traffic survey. 08
- b) Write a note on planning of parks and play grounds. 07
- Q.9 a) Explain the principle of neighborhood planning. 08
- b) Explain in details the causes of slum. 07
- Q.10 a) What are the housing problems in India? 08
- b) Explain selection of site for industries? 07

Total No. of Printed Pages:03

**SUBJECT CODE NO:- H-445**  
**FACULTY OF ENGINEERING 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 two questions from each section A and B.
  2. Assume suitable data where required and mention it clearly.
  3. Use of IS: 1343:1980 and 456:2000 is allowed.

**Section A**

- Q.1
- a) Compare R.C.C. & prestressed concrete with respect to analysis & design. 05
  - b) Enlist the immediate & time dependent losses occurring during pre-tensioning & post-tensioning. 05
  - c) Explain strength method, stress method & load balancing method of analysis of prestressed concrete. 10
- Q.2
- a) A pretensioned beam 250mm wide 400 mm deep is pre-stressed by 12 wires each of 8mm diameter. Initially stressed to  $1200 \text{ N/mm}^2$  with their centroids located 100mm from soffit. Estimate the losses due to elastic shortening, creep, shrinkage & relaxation for following data. Take  $E_c = 210 \text{ GPa}$  &  $E_s = 35 \text{ GPa}$ . 12
    - 1) Relaxation of steel assume 6%
    - 2) Creep co-efficient ( $\phi$ ) = 1.6
    - 3) Residual shrinkage strain =  $3 \times 10^{-6}$
  - b) Why high grade or strength material required for pre-stressing. 04
  - c) Define tendons & cable. 04
- Q.3
- a) An I shape prestressed concrete beam has dimensions flange 450mm  $\times$  150mm. web 600mm  $\times$  100mm. Tendon is located from soffit at 50mm. area of steel  $750 \text{ mm}^2$ . Find ultimate moment of resistance also find the udl including its own weight over a simply supported span of 10m. Take  $f_{ck} = 40 \text{ N/mm}^2$  &  $f_p = 1500 \text{ N/mm}^2$ . 10
  - b) Explain pressure line or thrust line & internal resisting couple briefly. 05
  - c) Enlist the different application of prestressing. 05
- Q.4
- a) A rectangular concrete beam 20cm  $\times$  30cm is prestressed by 15 wires located 6.5 cm from bottom & 3 wires 2.5 cm from top each wire is of 5mm diameter. Calculate stresses at extreme fibers of mid-span section. when beam supports its own weight & a live load of 6.5 kN/m over span of 8m. Take prestress in steel  $900 \text{ N/mm}^2$  & density of concrete  $24 \text{ kN/m}^3$ . 15
  - b) Discuss advantages & disadvantages of pre-tensioning & post-tensioning. 05

- Q.5 a) What is end block? Show stress distribution in anchorage zone & reinforcement details. 10  
 b) The end block of a beam. 120mm × 300mm Transmitting force of 250 kN by a 10  
 distribution plate 20mm wide & 75mm deep centrally located at ends. Find the position of  
 maximum tensile stress & its magnitude using guyon's method. Find bursting tension & ast  
 required.

Dist.ratio	Position of zero stress	position of max.stress	$\frac{\text{max stress}}{\text{avg stress}}$
0.2	0.14	0.30	0.36
0.3	0.16	0.36	0.33
0.4	0.18	0.39	0.27

**Section B**

- Q.6 a) A Composite T.beam is made up of a pretensioned rib 100mm × 200mm. With a CI slab 15  
 400mm × 40mm with  $E_c = 28GPa$ . If differently shrinkage is  $100 \times 10^{-6}$ units,  
 determine shrinkage stresses developed in the precast & cast in situ slab.  
 b) Differentiate cylindrical & non-cylindrical pipe with respect to analysis & design. 05

- Q.7 a) An electrical pole 10m high above ground level supports load of 1kN due to weight of 15  
 wires. Design the pole, if it has to carry reversible horizontal force of 2kN. Assume loss  
 due to shrinkage & creep as 15%. Safe compressive stress of  $12.5N/mm^2$ . The angle at  
 which soil just start to slide due to its own weight is  $30^0$ . Density of soil  $20kN/m^3$  take  $m=6$   
 &  $f_y=1000N/mm^2$ .  
 b) Discuss propped & un-propped section in case of composite section. 05

- Q.8 a) Write a short note on minimum shear reinforcement in beam section. 05  
 b) Enlist different modes of shear cracking. Explain any one of it. 05  
 c) A non-cylindrical pipe 1.5m in diameter & 80mm thick is required to convey water at 10  
 pressure of 1.5MPa. The limiting value of stresses maximum 15MPa & minimum 2MPa.  
 Assume loss of 15%. Design.  
 1) Circumferential wire winding with 5mm diameter wires when stressed to  $1kN/mm^2$ .  
 2) Longitudinal prestressing with  $7mm\phi$  wires stretched at  $1kN/mm^2$ . The maximum  
 allowable tensile stress under critical loading  $\geq 0.8f_{ck}$ . take  $M_{40}$ .

- Q.9 a) Write a short note on PSC sleeper. 05  
 b) A double 'T' section flange 1100mm & 150mm thick is prestressed by 5000mm<sup>2</sup> ast of 15  
 HYSD located at 1600mm. web is of 120mm thickness. Take  $f_{ck}=40\text{MPa}$ ,  $f_y =1500\text{MPa}$ .  
 Determine flexural strength as per IS:1343 provisions.
- Q.10 a) Design PSC '2' way slab 5m × 10m to carry a load of 4 kN/mm<sup>2</sup>. If the limiting value of 15  
 stress in tension & compression are '0' & 14.0 MPa. Design suitable thickness & spacing  
 of cable (12 of 5mm diameter stress at 1200 N/mm<sup>2</sup> initially) & position at central span.  
 b) Write short note on cracking moment. 05