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07-01-16

Re-Exam

T.Y.B.Tech.(Civil) Sem V  
Hydraulic Engg-I



BHARATIYA VIDYA BHAVAN'S  
**SARDAR PATEL COLLEGE OF ENGINEERING**  
GOVERNMENT AIDED AUTONOMOUS INSTITUTE  
ANDHERI (WEST), MUMBAI - 400 058.

**Re-Examination**  
January 2016

Max. Marks: 100

Duration: 3 hours

Class: T.Y. B.Tech. (Civil)

Semester: V

Name of the Course: Hydraulic Engineering-I

Program: Civil Engineering (UG)

Course Code: CE304

Master file.

**Instructions:**

1. Question No. 1 (One) is compulsory.
2. Out of remaining questions, attempt any 04 (four) questions.
3. In all 5 (Five) questions to be attempted.
4. Draw neat diagrams
5. Assume suitable data if necessary

| Question No. |   | Max. Marks |
|--------------|---|------------|
| Q1           | Explain (any four)<br>(a) HGL and TEL<br>(b) Theory of draft Tube.<br>(c) Pumps in series and parallel.<br>(d) Reynold's experiment.<br>(e) Three reservoir problem.  | (4x5)      |
| Q2 (a)       | A 25 cm wrought iron pipeline 750 meter long discharges water 125 meter below the surface of a reservoir. Determine the diameter of the nozzle which will deliver the maximum power. Assume $f = 0.022$ and coefficient of velocity of the nozzle is 0.96.  | (10)       |
| (b)          | A siphon of length 750 m has its vertex 7 meters above the water level in the upper reservoir. The length of inlet leg of siphon is 175 m and total head loss in siphon is 20 m. Determine diameter of the siphon such that pressure at summit does not fall below vapor pressure of water. Take $f = 0.02$ .               | (10)       |
| Q3 (a)       | Find the force on a 45 degree horizontal 30 cm x 15 cm reducing pipe bend carrying 12 cum /min of water at an inlet pressure of 30 m. Assume friction loss of 15 % of kinetic head at outlet.   | (10)       |
| (b)          | Water is admitted at the axis of rotation of a two arm lawn sprinkler. The nozzles facing opposite each other's has a diameter of 10 mm each and sprinkler arm have a length of 250 mm, for the flow rate of 2 liters/sec.<br>Find (i) Speed of rotation of sprinkler; and<br>(ii) Torque to keep the sprinkler stationary. | (10)       |

(1)

T.Y.B.Tech.(Civil) Sem V  
Hydraulic Engineering - I - Dt. 07/10/16.

- Q4 (a) A 5 cm in dia. jet of water with a velocity of 25 m/sec strikes on a square hinged vertical plate weighing 975 N normally at its centre. Find (i) angle of deflection of the plate; and (ii) force necessary at the lower edge to keep plate vertical. (10)
- (b) Show that the efficiency of a free jet striking normally on a series of flat plates mounted on the periphery of a wheel can never exceeds 50%. (10)
- Q5 (a) Explain in brief performance characteristics curves of hydraulic turbines; also explain the term specific speed of turbine. (10)
- (b) A Pelton wheel has a mean bucket speed of 12 meter/sec with a jet of water flowing at a rate of 0.85 cum/sec. under a head of 30 meter. The bucket deflects the jet through an angle of  $165^\circ$ . Assuming coefficient of velocity as 0.97, Calculate power and overall efficiency of turbine. (10)
- Q6 (a) Write short notes on:  
(i) Minimum starting speed of a centrifugal pump. (05)  
(ii) NPSH. (05)
- (b) The internal and external diameters of the impeller of a centrifugal pump are 30 cm and 60 cm respectively. The pump is running at 1000 r.p.m. The vane angles at inlet and outlet are  $20^\circ$  and  $30^\circ$  respectively. The water enters the impellor radially and velocity of flow is constant. Determine the work done by the impellor per unit weight of water. (10)
- Q7 (a) Explain with neat sketch working of:  
(i) Hydraulic accumulator; and (05)  
(ii) Hydraulic Lift (05)
- (b) State assumptions in Hardy-Cross method used in pipe network analysis and derive an expression for discharge correction for  $n = 2$ . (10)
- \*\*\*\*\*



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T.Y.B. Tech. - (Civil) sem V  
Transportation Engineering - I

Dec.2015

End Semester Re-Examination

T. Y. B. Tech. Civil (Sem - V)

Marks: 100

Course Name - Transportation Engineering - I (CE-305)

Duration: 3 Hr.

Note:

- (i) assume suitable data if required  
(ii) Question one is compulsory, solve any four Questions out of remaining six

Master file.

Q.1. Solve any four (5x4)

(20)

- (i) Discuss suitability of Different mode of transportation.  
(ii) Discuss with sketch different types of joints.  
(iii) Discuss various factors affecting selection of site for Harbour.  
(iv) Necessarily of Airport Drainage system.  
(v) Location of Exit Taxiway.

Q.2.

(a) Enumerate the various factors you would like to keep in mind while selecting suitable site for the Airport.

(10)

(b) Discuss how will you orient runway considering

- (i) Direction and total duration of wind (ii) Direction, Duration and Intensity of wind

(10)

Q.3.

(a) Discuss wing of the aircraft with respect to (i) lift to drag ratio, (ii) surface area, (iii) aspect ratio, (iv) camber shape of wing.

(12)

(b) An airport has 12 gates available to all types of aircraft. The aircraft mix at the airport during peak hours shown in the table below. If the utilization factor is 75 % find the capacity of the Gate to process the aircraft at this airport.

(08)

| Aircraft Type | Percentage Mix | Gate Occupancy Time |
|---------------|----------------|---------------------|
| A- Type       | 30 %           | 45 Minute           |
| B- Type       | 30 %           | 30 Minute           |
| C- Type       | 40 %           | 40 Minute           |

Q.4.

T.Y.B.Tech. (Civil) Sem IV  
Transportation Engg - I - Dt. 08/01/16

- (a) What do you mean by creep of rail. How to measure it. Why it occurs in permanent track (08)
- (b) write short notes on (i) weight of rail (ii) Length of rail (06)
- (c) Discuss with sketch different types of joints (06)

Q.5.

- (a) write short notes on (i) Different types of Gradient (ii) Cant Deficiency (iii) Negative cant, (iv) Different systems of signaling. (12)
- (b) Calculate the elements required to set out 1 in 12 turnout, taking off from straight broad gauge track with its curve starting from toe of switch. Heel divergence = 13.3. (08)

Q.6.

- (a) Discuss with sketch of left hand turnout showing important component part of point and crossing. (10)
- (b) A  $9^\circ$  branch curve diverge out from  $8^\circ$  main curve in opposite direction in a layout of meter gauge yard. If the speed on main line is restricted to 25 km/hr. determine the restricted speed on branch line. (10)

Q.7.

- (a) Write a note on water transportation and explain various modes of water transportation with block diagram. (10)
- (b) What do you understand by breakwater. Explain different types of breakwater with neat sketch. (10)

(2)



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Re-Exam  
Nov-Dec 2015

Duration: 3 hours

Marks: 100

Class/Branch: T.Y B.Tech (Civil)

Semester: V

Name of the Course: Entrepreneurship & Management

Programme: Civil Engineering

Course Code: CE306

T.Y. B.Tech. (Civil) sem V

Master file.

Note: Entrepreneurship & Management.

- Attempt any five questions.
- Assume suitable data if required.
- Answers to all sub-questions should be grouped together.

- Q.1. a) Explain the concept of Entrepreneur & Entrepreneurship with one examples? (10 marks)  
b) What are the different kinds of characteristics should possess by entrepreneur? (Any ten)  
(10 marks)
- Q.2. a) Discuss the various classification/types of entrepreneurs along with one examples. (10 marks)  
b) Explain the McClelland Need for Achievement Theory with Kakinada experiments? (10 marks)
- Q.3. a) Describe contribution made by "Fredrick Taylor" towards scientific management? (10 marks)  
b) Describe contribution made by "Henry Fayol" towards Administrative approach  
management? (10 marks)
- Q.4. a) what do you mean by the Project? Explain the formulation of project? (10 marks)  
b) What are different sources & types of finance available for entrepreneurship in India?  
(10 Marks)
- Q.5. a) Define the small scale industry and also Highlight the chief characteristics of it? (10 marks)  
b) Explain in detail various steps to be followed in start up the small scale industry? (10 marks)

Q.6. a) Write short note on: Break-even analysis.

(4 Marks)

b) An initial investment in plant & machinery of ₹ 11000 is expected to generate cash flows of ₹ 2342, ₹ 3200, ₹ 4850, ₹ 6230 at the end of first, second, third & fourth year respectively. At the end of fourth year machines will be sold for ₹ 800 as salvage value. Calculate the net present value of the investment if the discount rate is 13%.

(6 Marks)

c) Journalize the following transactions in the books of Mr. Raheja for Oct 2014 & also post them in ledger for cash account only.

(10 marks)

| Date | Transactions                                   | Amount |
|------|--|--------|
| 1    | He started the business with cash              | 300000 |
| 3    | Received interest                              | 1600   |
| 8    | Purchased goods on credit from Devang.         | 34000  |
| 10   | Paid office rent by cheque of Bank of India    | 4800   |
| 12   | Paid commission to Rajkumar                    | 600    |
| 16   | Deposited money in bank of India               | 20000  |
| 19   | Sold goods to Mr. Anwar for cash               | 7500   |
| 24   | Returned goods to Mr. Narayan                  | 2000   |
| 26   | Purchased furniture from Keshav furniture Mart | 17000  |

Q.7. Write short notes on: - (any four)

(20 marks)

- i. SWOT analysis.
- ii. Discounted Cash Flow Technique.
- iii. Social-Cost benefit analysis.
- iv. Matrix & Functional Organization.
- v. Importance of Small Scale Industries in India.
- vi. Line & line-staff Organisation.

T.Y.B.Tech. (Civil) Sem V  
Structural Analysis - II



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Munshi Nagar, Andheri(West), Mumbai 400 058



**Re Examination**  
January 2016

Max. Marks : 100

Duration : 3 Hours

Class: TY BTech

Semester: V

Program: BTech in Civil Engineering

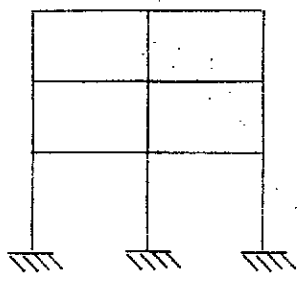
Name of the Course: Structural Analysis - II

Course Code : CE 301

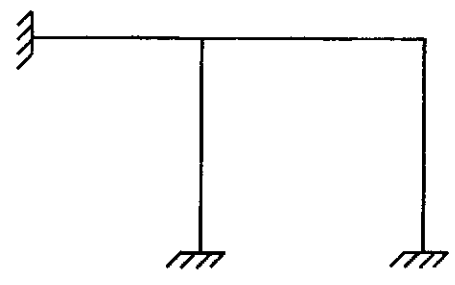
- Attempt any FIVE questions out of SEVEN questions.
- **Answers to all sub questions should be grouped together.**
- Figures to the right indicate full marks.
- Assume suitable data if necessary and state the same clearly.

*Master file.*

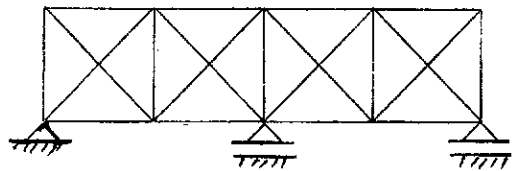
Q.1 (a) Determine the static and kinematic indeterminacy of the structures shown (10) in figures below.



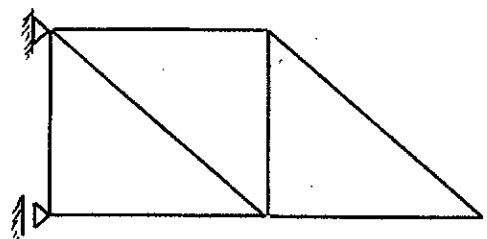
(i)



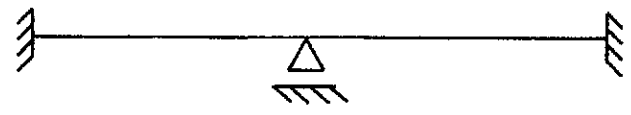
(ii)



(iii)



(iv)

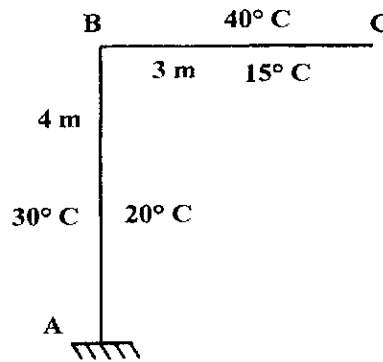


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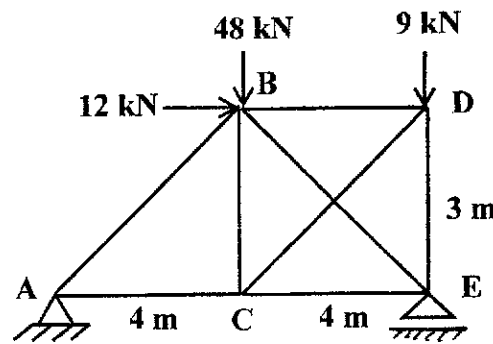
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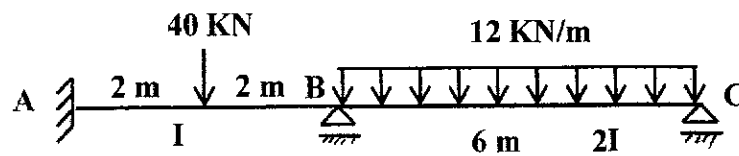
- Q.1 (b) For the frame shown in figure calculate the vertical deflection of C due to change in temperature as indicated in figure. Take  $\alpha = 12 \times 10^{-6} / ^\circ\text{C}$  and depth of all members as 300 mm. (10)



- Q.2 (a) Find the force in the redundant member BE of the truss loaded as shown in figure below. (Take force in member BE as the redundant force.) Assume AE to be same for all the members. (10)



- Q.2 (b) Analyse the continuous beam shown in figure using three moment theorem. (10)

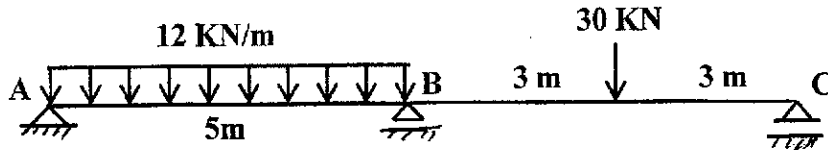


(2)



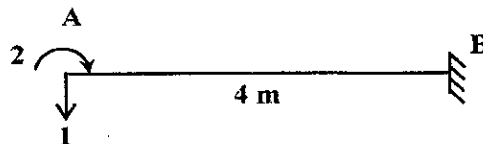
T.Y.B.Tech. (Civil) Sem V.  
Structural Analysis - II - Dt. 04/01/16.

- Q.3 (a) Find the reaction at C in the continuous beam shown in figure using the theorem of least work. (10)

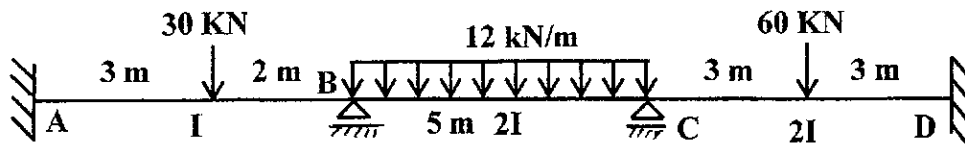


- Q.3 (b) A two hinged parabolic arch of span 24 m and rise 4 m carries two concentrated loads each of 30 kN at a distance of 5 m from either end (i.e. support). Determine the horizontal thrust in the arch. The moment of inertia (MI) of the section of the arch varies as  $I = I_0 \sec^2 \theta$ , where  $I_0 = MI$  of the section at the crown. (10)

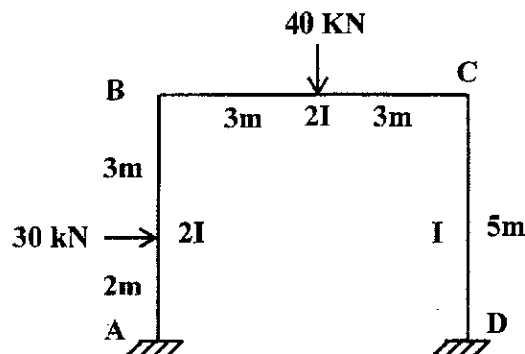
- Q.4 (a) Calculate the flexibility coefficients for the beam shown in figure w.r. to the coordinates indicated in figure. (08)



- Q.4 (b) Analyse the beam shown in figure by moment distribution method. (12)

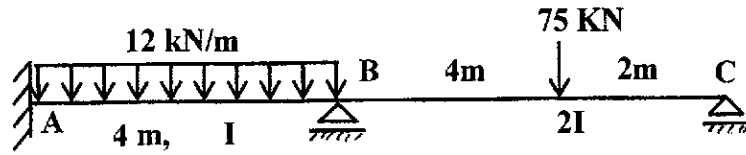


- Q.5 Analyse the frame shown in figure by slope deflection method. Draw BMD. (20)



(3)

Q.6 (a) Analyse the beam shown in figure by stiffness method. (12)



Q.6 (b) (i) Explain the advantages and disadvantages of indeterminate structures over determinate structures. (04)

(ii) Write a note on theorem of least work. (04)

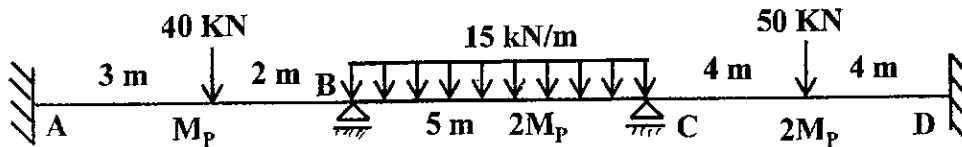
Q.7 (a) Find the shape factor for the unsymmetrical I section with the following data. (10)

Top flange - width = 300 mm, thickness = 20 mm

Bottom flange - width = 200 mm, thickness = 14 mm

Depth of web = 250 mm, thickness of web = 16 mm.

Q.7 (b) A continuous beam is subjected to working loads as shown in figure below. (10)  
 If  $M_p = 100$  kN-m, calculate the (true) load factor for the beam.



(4)

T.Y.B.Tech (Civil) sem V  
Geotechnical Engineering - I.



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**RE-EXAMINATION January 2016**

Max. Marks: 100

Class: T.Y. B. Tech.

Duration: 3 hours

Semester: V

**Course: CE 302- Geotechnical Engineering - I**

Program: Civil Engineering

Note:

Master file :

- Question 1 is compulsory.
- Attempt any four out of remaining six questions.
- Assume suitable data if required and state it clearly. State units at all possible places.
- Group all sub-questions together.

- a) Define: Total pressure, neutral pressure and effective pressure. (05)
  - b) Prove that  $e \cdot Sr = w \cdot G$  with usual notations, using first principles. (05)
  - c) A consolidated drained triaxial test was conducted on a saturated specimen of cohesionless sand and it failed at a deviator stress of 280 kPa. The failure plane made an angle of  $58^\circ$  with the horizontal. Calculate the principal stresses analytically. If another sample of the same soil is tested at a cell pressure of 200 kPa, determine analytically the deviator stress at failure. (05)
  - d) What is compaction? Explain the factors affecting soil compaction (05)

- a) Classify the following soils as per IS:1498 - 1970 (05)

| Soil A        | Soil B       |
|---------------|--------------|
| % Gravel = 30 | % Gravel = 0 |
| % Sand = 60   | % Sand = 22  |
| $C_u = 12$    | % Silt = 61  |
| $C_c = 2.1$   | % Clay = 17  |
|               | LL (%) = 42  |
|               | PL (%) = 20  |

- b) Describe the procedure to determine preconsolidation pressure in the laboratory. State the importance of this parameter. (05)
- c) In a direct shear test (box size 6cm x 6cm) on a sand sample, the following observations were made. Determine the shear parameters. Also calculate the magnitude and orientation of principle stresses for the second sample. (10)

| Sample No. | Normal Load (kg) | Shear Load (kg) |
|------------|------------------|-----------------|
| 1          | 44               | 30.8            |
| 2          | 83               | 58.2            |
| 3          | 121.8            | 85.5            |

(1)

3. a) A soil investigation for performed at a site. The following soil profile and properties were obtained: (05)
- 0 to 4.5m – Sandy Fill ( $\gamma_{sat} = 1.98t/m^3$ )  
4.5m to 13.5m – NC clay ( $\gamma_{sat} = 2.02t/m^3$ )  
(LL = 52%, NMC = 36% and G = 2.71)  
12.5m to end of borehole (25m) – impermeable rock.  
GWT at ground surface.  
Additional load due to construction of a structure is estimated to be  $1.5t/m^2$  at the center of the clay layer. Estimate the magnitude of consolidation.
- b) Referring to Q3 b), a sample of the clay layer from the site was tested in the laboratory. 90% consolidation of the 20mm thick sample took 15min when drainage was permitted only from the top. Calculate the time taken for 90% consolidation of the clay layer at site. (05)
- c) Draw the sketch of a typical bore log and show typical information details obtained. (10)  
Explain the importance of soil investigation in a construction project.
- 4 a) A sample of soil was taken from a site and tested in the laboratory. The following observations were made. Calculate the bulk density, dry density, saturated density, degree of saturation and moisture content. (10)
- Wet weight of sample = 256g  
Dry weight of sample = 212 g  
Volume of wet sample = 140 cc  
Specific gravity = 2.65
- b) Describe soil classification as per AASHTO standards. (10)
- 5 a) In a constant head permeability test on a sand sample with diameter 7.5cm and height 6.8cm, 12ml of water was collected in 60sec under a head of 61cm. Calculate the coefficient of permeability and velocity of flow. (05)
- b) Define void ratio and porosity. Develop a relation between them using the first principles. (05)
- c) Explain the square root of time fitting method used to calculate  $C_v$ . (10)
- 6 a) Explain Taylor's stability number and its use in determining stability of slopes. (05)
- b) What is quick sand condition? Derive the equation for critical gradient. (05)
- c) Explain the various factors affecting permeability of soil. (10)
- 7 a) State true or false: All clay soils are unsuitable for construction. Explain the reasons for your answer. (05)
- b) What is a flow net? Explain its characteristics with a neat sketch. (05)
- c) Explain the pumping out test to determine permeability of soil. (10)