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**B.E. (Civil) (Part - IV) (Semester - VIII) (Revised)**  
**Examination, November - 2019**  
**ADVANCED CONSTRUCTION TECHNIQUE (Elective - III)**  
**Sub. Code : 67764**

Day and Date : Wednesday, 20 - 11 - 2019

Total Marks : 100

Time : 02.30 p.m. to 05.30 p.m.

- Instructions :
- 1) All questions are compulsory.
  - 2) Figures to the right indicate full marks.
  - 3) Make assumptions wherever necessary.

**SECTION-I**

**Q1)** Answer the following. **[2 × 10 = 20]**

- a) What is meant by composite construction? Discuss steel-concrete composite construction.
- b) State the various factors that are taken into account while designing the form work & Explain Economical analysis of form work.

**Q2)** a) Explain fiberglass reinforced concrete? Discuss its important properties. & The major areas of application. **[8]**

- b) What is meant by MDF? State the important properties of MDF as a construction material. **[7]**

OR

- a) Write various methods of improving bearing capacity of water logged area. **[8]**

- b) Explain methods of land reclamation with sketch. **[7]**

**Q3)** Write short notes on any three. **[3 × 5 = 15]**

- a) Drainage system in land reclamation.
- b) Special form work.
- c) Use of geo-synthetics in construction.
- d) Maintenance of form work.



**P.T.O**

**SECTION-II**

- Q4)** a) Explain with neat sketch the operational layout of nuclear power station. [8]  
 b) Explain the slip form paving in pavement construction. [8]

- Q5)** a) Explain the necessity of bridge rehabilitation. [8]  
 b) What are the various steps of construction of diaphragm walls. [8]

OR

- a) What is underpinning & state of the use of it. [8]  
 b) State the benefits of revibration of concrete. [8]

- Q6)** Short Note (Any Three) : [18]

- a) Foundation Jacketing.  
 b) Roller Compacted Concrete.  
 c) Wind Mill  
 d) Retaining Structure.





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**B.E. (Civil) (Part - II) (Semester - VIII)**  
**Examination, November - 2019**  
**WATER RESOURCES ENGINEERING - II**  
**Sub. Code : 67749**

Day and Date : Thursday, 14 - 11 - 2019

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :
- 1) Answer any three questions from each section.
  - 2) Figures to the right indicate full marks.

**SECTION - I**

- Q1) a) Enumerate the terms, reservoir, single purpose reservoir, multi-purpose reservoir. Enumerate the purposes of reservoir. [6]
- b) Enumerate the points which should be considered while choosing the site for a reservoir. [6]
- c) What are the different investigations required while carrying out reservoir planning. Explain briefly. [6]
- Q2) a) How the earth dams are classified depending on methods of construction. Explain the two common methods of construction of earth dams with suitable sketches. [6]
- b) Draw the neat sketch of a zoned earth dam and name its various components. [4]
- c) Explain briefly the functions of following components of earthen dams. [6]
- i) Rip -Rap layer
  - ii) Horizontal drainage filter
  - iii) Cutoff trench
  - iv) Rock toe.



- Q3) a) Figure given below (Fig. 1) shows the section of a concrete gravity dam. Do the stability analysis considering only the following forces.

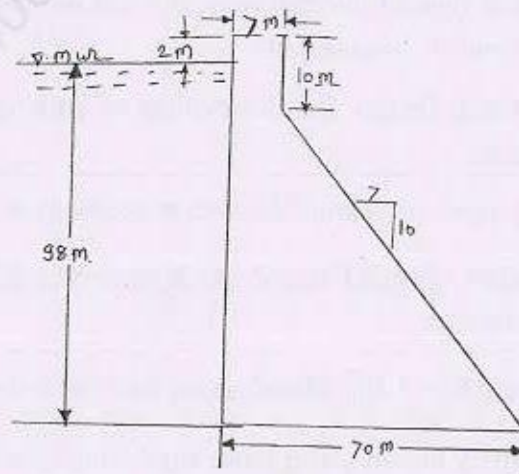


Fig -1

- i) Water Pressure      ii) Self-weight of Dam
- iii) Uplift pressure and, calculate the following      [10]
- i) Factor of safety against overturning
- ii) Factor of safety against sliding
- iii) Maximum and Minimum vertical stress at foundation level.
- iv) Principal stress at toe
- v) Maximum shear stress at toe.

Take,

- i) Specific weight of water =  $9.81 \text{ kN/m}^3$ ,
- ii) Specific weight of concrete =  $23.5 \text{ kN/m}^3$ ,
- iii)  $\mu = 0.7$ ,

Assume No Tail water condition.

- b) Explain with neat sketches various types of arch dams.      [6]

- Q4) a) Enlist various types of spillways and explain any two types of spillways in detail.      [8]

- b) Enlist various types of spillway gates and explain any two types in detail. [8]



SECTION - II

- Q5) a) Sketch the layout of typical diversion head work & describe briefly the functions of the various components. [8]
- b) Discuss Bligh's creep theory for the design of weir constructed over pervious foundation. [8]
- Q6) a) What is balancing depth in a canal? Derive an expression for the same. [8]
- b) Design an irrigation channel based on Kennedy's theory to carry a discharge of 48 cumecs. [8]
- take  $N = 0.0225$  and  $M = 1.05$ . The channel has a bed slope as 1 in 5000.
- Q7) a) What do you mean by meandering type, aggrading type, degrading type of rivers. What are the causes of meandering of rivers. [8]
- b) How are river training works classified. Explain the methods of high water river training. [8]
- Q8) Write notes on any three: [18]
- a) C.D. works necessity & types.
- b) Standing wave flume
- c) Head regulator & cross regulator
- d) Types of Hydropower plants.



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**B.E. (Civil Engineering) (Semester - VIII)**  
**Examination, November - 2019**  
**STRUCTURAL DESIGN OF FOUNDATION**  
**AND RETAINING STRUCTURES**  
**(Elective- II)**  
**Sub. Code :67753**

Day and Date :Tuesday, 19-11-2019  
Time : 02.30 p.m.to 5.30 p.m.

Total Marks :100

- Instructions :
- 1) Solve any two questions.
  - 2) Figures to the right indicate full marks.
  - 3) Use of Is 456 - 2000 is allowed.
  - 4) Assume suitable data if necessary and mention it clearly.
  - 5) Use of non-programmable calculator is allowed.

**SECTION-I**

- Q1)** Design a reinforced concrete combined rectangular footing for two columns A and B located 3.60m apart. The overall sizes of the columns are 400mm × 400mm and 600mm × 600mm and the loads on them are 1000 KN and 1500 KN respectively. The projection of the footing parallel to the length of footing beyond the axis of the column A is restricted to 590mm. The safe bearing capacity of soil is 280 kN/m<sup>2</sup>. Use M20 concrete and Fe 415 steel. [25]
- Q2)** A column 300 mm × 300mm in section stands on a pile cap supported on three piles. The column is situated at the centroid of the pile group. the total load transferred to the column is 600kN. The piles are 1.20m centre to centre. Design the pile cap. Use M20 and Fe 415 steel. [25]
- Q3)** A building contains 12 columns 400mm × 400mm in three rows of four each. The distance between the columns is 4m. Each of the four corners columns carry a load of 600kN, each exterior columns carry a load of 900kN and each of the interior columns carry a load of 1500kN. The net bearing capacity of the soil is 100kN/m<sup>2</sup>. Design a raft foundation using M30 concrete and Fe 415grade steel. [25]

P.T.O.





**SECTION-II**

- Q4) a) Explain procedure of sinking of well foundation with neat sketch. write remedies taken during sinking operation of well foundation [13]
- b) Explain in detail various forces acting on well foundation? [12]
- Q5) Design a stem heel and toe slab for a cantilever retaining wall. To retain earth embankment of 4.5m high above ground level. The angle of repose is  $30^\circ$ . The embankment is horizontal at top of retaining wall. Take unit weight of earth is  $18 \text{ kN/m}^3$ . Safe bearing capacity of soil is  $180 \text{ kN/m}^2$ . The coefficient of friction between soil and concrete is 0.50. Use grade of concrete  $M_{20}$  and grade of steel Fe 415. [25]
- Q6) a) Explain in detail classification of breakwaters? Draw cross section of rubble mound breakwater. [12]
- b) Design armor of rubble mound break water if depth of water is 16.0m and wind velocity is 150km/hour. The fetch of wave is observed to be 200km. Allowable bearing pressure on rock is  $800 \text{ kN/m}^2$ . [13]



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**B.E. (Civil Engineering) (Semester - VII) (New)**  
**Examination, November - 2019**  
**DESIGN OF CONCRETE STRUCTURES - I**  
**Sub. Code: 67558**

Day and Date : Saturday, 23 - 11 - 2019  
 Time : 10.00 a.m. to 1.00 p.m.

Total Marks : 100

- Instructions :
- 1) Attempt all questions from section - I and II.
  - 2) Figures to the right indicate full marks.
  - 3) Assume any suitable data whenever necessary.
  - 4) Use of non-programmable calculator and relevant I.S. 456:2000 are allowed.

**SECTION - I**

- Q1) a) Find  $X_{u,max}$ ,  $P_{t,lim}$ , and  $M_{u,lim}$  for Fe250 steel and M20 concrete. [8]  
 b) What do you understand by a "Limit State"? What are the different limit states to be accounted in design of RC structures. [8]
- Q2) a) Explain the various modes of failure in RC beam. [4]  
 b) A double reinforced beam section 250mm wide and 450mm deep to the centre tensile reinforcement. It is reinforcement with 2-16mm  $\varnothing$  as compression reinforcement at an effective cover of 50mm and 4-25mm  $\varnothing$  as tensile steel. Using M20 concrete and Fe 250 steel, Calculate ultimate moment of resistance of the beam section. [14]
- OR
- a) Explain the necessity of doubly reinforced sections. [4]  
 b) Find the moment of resistance of a T-beam section having  $b_w = 240mm$ ,  $b_f = 700mm$ ,  $D_f = 90mm$  and  $d = 600mm$ . The reinforcement consists of 5 bars of 25mm  $\varnothing$ . Use M15 concrete and Fe415 steel. [14]
- Q3) a) Explain in brief the IS recommendations to control cracks. [4]  
 b) A simply supported reinforced concrete beam is 250mm wide 500mm deep to the centre of tensile reinforcement and is reinforced with 5-18mm  $\varnothing$  as tensile steel. If the beam is subjected to a factored shear of 105kN, design the shear reinforcement consisting of stirrups. Use M20 concrete and Fe 250 steel. [12]

P.T.O.





SECTION - II

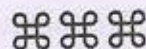
- Q4) Design a slab over a room having internal size  $4\text{m} \times 6\text{m}$ . The slab carries a Live load of  $3\text{ KN/m}^2$  and Floor finishing load  $0.75\text{ KN/m}^2$ . The two adjacent edges of slab are discontinuous. The width of the supporting walls is  $250\text{mm}$ . Use M25 grade concrete and Fe 415 steel. Draw the reinforcement details. Assume mild exposure condition. [16]

OR

Design dog legged stair of an office building measuring  $3.5\text{m} \times 5.25\text{m}$ . The vertical distance between the floors is  $3.6\text{m}$ . The live load on the stairs is  $3\text{ KN/m}^2$ . Use M20 concrete and Fe 415 steel. [16]

- Q5) A. R. C. column  $250\text{mm} \times 450\text{mm}$  is to be provided in sever environmental exposure condition. It is reinforced equally on two short sides by  $4 \times 20\text{mm}$  dia. on each side. Calculate the ultimate load and ultimate moment the column can resist, when neutral axis lies on short edge of column. Use M30 concrete and Fe 500 steel. [17]

- Q6) Design an isolated footing of constant depth for R. C. column of size  $300\text{mm} \times 500\text{mm}$ , subjected to a axial service load of  $910\text{ KN}$ . The safe bearing capacity of soil as  $200\text{ KN/m}^2$ . Use M25 concrete and Fe 415 steel. [17]



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**B.E. (Civil) (Part - IV)(Semester - VIII)**  
**Examination, November - 2019**  
**TRANSPORTATION ENGINEERING - II**  
**Sub. Code : 67750**

Day and Date : Friday, 15 - 11 - 2019

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :
- 1) All questions are compulsory.
  - 2) Figures to the right indicate full marks.
  - 3) Make assumptions wherever necessary.
  - 4) Use of non-programmable calculator is allowed.

**SECTION - I**

**Q1)** Answer any two of the following:

- a) Describe in detail necessity, scope and principles of town planning. [8]
- b) Explain the contribution of different town planners in modern era. [8]
- c) Describe the present status and different strategies of town planning. [8]

**Q2)** Answer any two of the following:

- a) Explain the natural and planned growth patterns of towns. [9]
- b) List different types of zoning in town planning and explain any one in detail. [9]
- c) Why rehabilitation of slum is necessary? Describe how it helps in town planning. [9]

**Q3)** Answer any two of the following:

- a) Describe in detail the importance of development control rules in town planning and explain it in brief. [8]
- b) State the importance provision of Land Acquisition act. [8]
- c) Explain the planning methodology for rural development. [8]



P.T.O.



SECTION - II

**Q4)** Answer any two of the following:

- a) Draw a cross section of permanent way and name the components parts. Mention the function of each component. [8]
- b) What is necessity of geometric design of railway track? State the various features of geometric design for a track. [8]
- c) Sketch a typical layout of Terminal station. Give classification of station yards. [8]

**Q5)** Answer any two of the following:

- a) State the objectives of signaling and give classification of signals based on function. [9]
- b) Describe the stages of construction of railway track. [9]
- c) State the necessity of track maintenances. Differentiate between daily and periodic maintenances. [9]

**Q6)** Answer any two of the following:

- a) What are the factors considered for selecting a site of a bridge? [8]
- b) Explain briefly the several forces to be considered in the design of a bridge and bringing out their relative importance. [8]
- c) State the types of bridge bearing and explain the suitability of each. [8]

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**B.E. (Civil) (Semester - VII) Examination, November - 2019**  
**EARTHQUAKE ENGINEERING**  
**Sub. Code : 67559**

Day and Date : Tuesday, 26 - 11 - 2019

Total Marks : 100

Time : 10.00 a.m. to 1.00 p.m.

- Instructions :
- 1) Attempt any three questions from each section.
  - 2) Use of non-programmable scientific calculator and only is 1893 (Part - I): 2002 is allowed.
  - 3) Figures to the right indicates full marks.
  - 4) Assume suitable data if necessary and mention it clearly.

**SECTION - I**

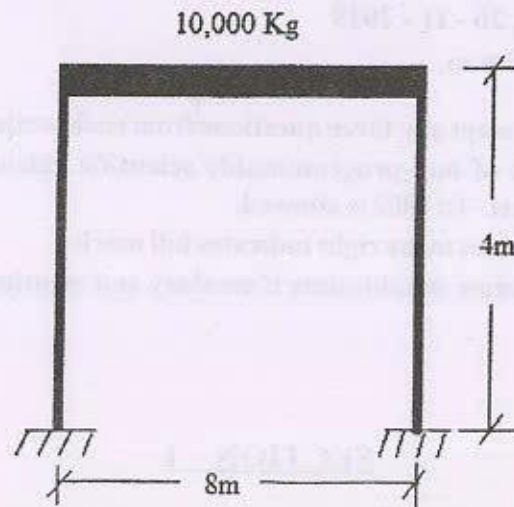
- Q1) a) With a neat sketch explain seismograph. How epicenter of earthquake is located? [8]
- b) What is the theory of Plate Tectonics? Explain types of plate boundaries. [8]
- Q2) a) Derive the equation of motion and its solution for forced undamped vibration system. [7]
- b) A SDOF vibrating system is having following parameters: [10]
- $m = 20 \text{ Kg}$ ,  $K = 70 \text{ N/m}$ ,  $C = 20 \text{ NS/m}$
- i) Natural frequency
  - ii) Damped frequency
  - iii) Damping ratio
  - iv) Logarithmic decrement
  - v) Number of cycles after which the original amplitude reduces to 1/20 of maximum.

P.T.O.





- Q3) a) Explain in details Logarithmic decrement. [7]  
 b) A rigid steel frame with slab is supported on four columns with  $EI = 1.5 \times 10^{12} \text{ Nmm}^2$  subjected to load of 10000 Kg as shown in fig. The system is subjected to a harmonic force of  $250 \sin 50t \text{ KN}$ . Consider 25% damping and  $E = 2.1 \times 10^5 \text{ Mpa}$ . Calculate maximum dynamic amplitude. Also state whether system will have resonance or not? [10]



- Q4) A three storied RCC building is to be constructed in Mumbai by using recommendations of IS 13920. Determine the lateral force and base shear at each floor level if the soil strata is medium. [17]

- No of bays along X direction = 3,
- No of bays along Y direction = 3,
- Size of each bay =  $4\text{m} \times 5\text{m}$
- Ht of each floor 3m,
- Size of all column  $300\text{mm} \times 350\text{mm}$ ,
- Size of all beams  $300\text{mm} \times 450\text{mm}$ ,
- Thickness of slab and external wall 120 mm and 230mm respectively,
- L.L. on floors  $3.5 \text{ KN/m}^2$
- 7% Damping

## SECTION - II

- Q5) a) What are the planning aspects required for earthquake resistant structure? [8]  
 b) Write a note on liquefaction and effects of liquefaction. [8]  
 Q6) a) What do you mean by load path? Explain strong column weak beam theory. [9]  
 b) Explain ductile detailing of column as per IS 13920. [9]  
 Q7) a) What is the influence of openings in masonry building. [8]  
 b) Write a note on repair and strengthening of RCC Structure. [8]  
 Q8) a) What is base isolation? Enlist types of base isolators and explain any one of them. [10]  
 b) Explain Active control system and passive control system. [6]

