

END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] DECEMBER 2016 – JANUARY 2017

Paper Code: ETCE-405

Subject: Transportation Engineering-II

Time: 3 Hours

Maximum Marks: 75

Note: Attempt all questions as directed. Internal choice is indicated.

- Q1 Attempt **any five** parts from the following: (5x5=25)
- (a) What is the significance of transportation engineering in national development?
 - (b) Enlist the silent features of railways.
 - (c) Define the point and crossing in the railway operation with drawing the neat sketch?
 - (d) What do you understand by capacity of railway track?
 - (e) What should be the actual ruling gradient?
 - (i) If the ruling gradient is 1 in 200 on a B.G.
 - (ii) A curve of 3° is superimposed on the above track section of B.G.
 - (f) Define the tunneling and their use in transportation?
 - (g) Write down the requirements of taxiway?

- Q2 What do you understand by gradient? Define momentum gradient, pusher gradient and ruling gradient. (12.5)

OR

Define the railway track? Discuss the functions and requirements of component parts of a railway track? (12.5)

- Q3 What are the functions of a railway station? Discuss the various requirements of a railway station. (12.5)

OR

What do you understand by signaling and interlocking? Write down the objects of signaling. (12.5)

- Q4 Discuss the method of tunnel construction in rocks. Write down the advantage and disadvantage of tunnel construction. (12.5)

OR

Describe the advantage and disadvantage of the different railway systems which can be used for urban transportation. (12.5)

- Q5 Describe the components parts of airport and site selection in details. (12.5)

OR

Discuss the design of airport drainage system with neat sketch. (12.5)

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END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] DECEMBER 2016

Paper Code: ETCE-403

Subject: Irrigation Engineering

Time: 3 Hours

Maximum Marks: 75

Note: Attempt any five questions including Q.No1 which is compulsory.
Select one question from each unit.

- Q1 Answer the following:- (2.5x10=25)
- (a) Define irrigation and explain its necessity in a tropical country like India.
 - (b) What are the different "canal regulation works,
 - (c) Define consumptive use and its estimation.
 - (d) Water-shed canals and contour canal alignment
 - (e) What are the applications of Khosla's theory
 - (f) What is meant by canal fall what are the different canal falls
 - (g) What are the methods of removal of silt accumulation behind a river regulator?
 - (h) What are 'cut-offs'? How are they used as a method of river training?
 - (i) What is meant by "Afflux" and how does it effect the design of weirs and barrages?
 - (j) Discuss the geological and topological features which affect the selection of the type of dam?

UNIT-I

- Q2 (a) What are the impurities which make the water unfit for irrigation? Also mention what are the effects of these impurities? (5)
- (b) What is meant by "Duty", what are the factors affecting duty, explain the different methods improving duty, also, find the delta for a crop when its duty is hectares/cumec on the field, the base period of this crop is 120 days. (7.5)

- Q3 (a) What are 'Canal outlets'? What are the requirements of a good 'canal outlets' Enumerate the different types of outlets which are in common use on canal projects? Describe briefly with a neat sketch the functioning, use and design of a "Submerged pipe outlet"? (7.5)
- (b) Design a concrete lined channel to carry a discharge of 350cumes at a slope of 1 in 6400. The side slopes of the channel may be taken as 1.5:1 the value of n for lining material may be taken as 0.013. Assume limiting water depth of the channel as 4.0m. (5)

UNIT-II

- Q4 (a) Explain briefly Khosla's exit gradient concept with neat sketches. (5)
- (b) An impervious floor of a weir on permeable soil is 16 m long and has sheet piles at both the ends. The upstream pile is 4m deep and the downstream pile is 5m deep. The weir created a net head of 2.5m. Neglecting the thickness of the weir floor, calculate the uplift pressures at the junction of the inner faces of the pile with weir floor, by using Khosla's theory. (7.5)
- Q5 (a) What is meant by Canal Falls? What are the adoptable situations of the different types of the canal falls? (4)
- (b) Design a 1.2m sarda fall for a channel carrying 25m³/s of water at depth of flow equal to 1.8m. The bed width of the channel is 20m. (8.5)

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UNIT-III

- Q6 (a) How would you estimate the afflux and the uplift pressure on the roof of the barrel of a siphon aqueduct? (4)
- (b) Design a canal siphon for the following data:
- (i) Canal:- Full supply discharge: 50 cumecs, Full supply level = 202.30, Bed Level = 200.00, Bed Width = 20.0m, Side slopes = 0.5:1
- (ii) Drainage:- Catchment Area = 65 km². Dicken's coefficient = 5.0 ($Q = CA^{3/4}$)
Bed level = 201.00, H.F.L. = 203.5
Assume any other data, if required suitably. (8.5)
- Q7 (a) What are the functions of canal head regulator? Discuss the general considerations for its design. (6)
- (b) Design a head sluice for a canal, intended to irrigate 24,000 hectares at a duty of 800 hectares per cumec. For the main canal taken from a river assume the following data: (i) Head available to permit full supply in canal = 0.30m, (ii) Bed width of canal = 20m, (iii) FSD in canal = 1.5, and (iv) Depth in the river at max. water level = 4.2m. (6.5)

UNIT-IV

- Q8 (a) What is meant by elementary profile of a gravity Dam, and how it is deduced? What should be the maximum depth of elementary profile of a dam if the safe limit of stress on masonry should not exceed 1500 kN/m². (5)
- (b) Determine the uplift force at the base of a gravity dam of height 30m plus 3m free board, top width 6m, base width is 25m and tail water depth is 5m for the following three cases: (i) No drains, (ii) With drains and grout curtain at a distance of 5m from the upstream end, (iii) Tension crack up to 2m from the upstream end. (7.5)
- Q9 (a) How would you compute the discharge over an ogee-shaped spillway? Discuss the various factors which affect the coefficient of discharge. (6.5)
- (b) Name the important types of river training methods indicating the purpose for which each type is adopted. (6)

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SEVENTH SEMESTER [B.TECH] DECEMBER- 2016

Paper Code: ETCE-413

Subject: Earthquake Technology

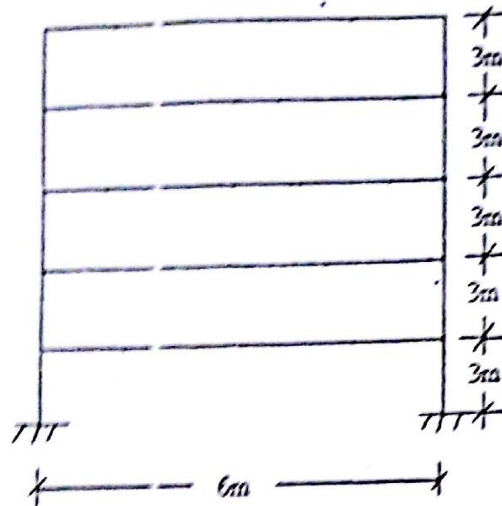
Time: 3 Hours

Maximum Marks: 75

Note: Attempt any six questions including Q.No1 which is compulsory.
Assume any missing data suitably, if not given.

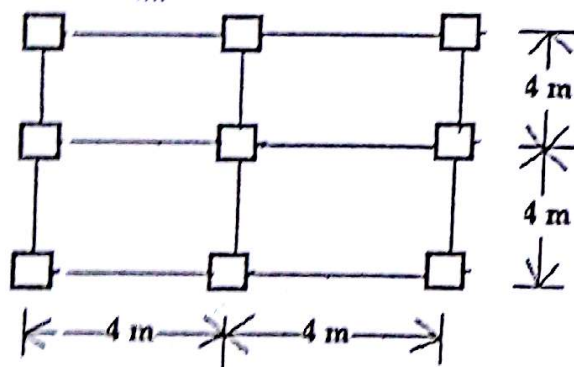
- Q1 Attempt **any five** parts from the following:- (5x5=25)
- (a) What is an earthquake? How do human activities induce earthquake?
 - (b) What is meant by focus and epicenter of an earthquake? Name the two kinds of body waves and explain how they differ.
 - (c) Explain briefly the Modified Mercalli scale?
 - (d) Derive a mathematical expression defining the dynamic displacements using the d'Alembert's principle?
 - (e) State the assumptions made in the analysis of earthquake resistant design of buildings?
 - (f) In what way is the earthquake resistance of structure affected by non-symmetry?
 - (g) Discuss the factors required for assessing the design response spectrum?
- Q2 Irregularities of mass, stiffness and strength are not desirable in buildings situated in the earthquake prone areas. Describe using diagrams how these occur and affect the buildings? (10)
- Q3 Write short notes on:- (10)
- (a) Strength and stiffness
 - (b) Stiff and flexible buildings.
- Q4 Discuss how to increase the following for a building in an earthquake prone area: (10)
- (a) Period of vibration
 - (b) Energy dissipation capacity
 - (c) Ductility
- Q5 Define shear walls. How these are classified? What is the difference between the structural behavior of long and short term column? (10)
- Q6 Figure shows the frame of a RC building to be constructed in Kerala. The spacing of frames is 3.6 m c/c. The floor beams support 120mm thick masonry wall. Compute the seismic forces. (10)
- Data: Size of column=230mm x 400mm
Size of beam= 230mm x 500mm
Slab thickness=120mm
Weight of concrete=24kN/m³
Weight of masonry=19 kN/m³
LL on roof=1.5kN/m²
LL on floors=5 kN/m²
Assume relevant data, if required.

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Q7 Design a rectangular beam for 8m span to support a DL of 10kN/m and a LL 12 kN/m inclusive of its own weight. Moment due to earthquake load is 100kN-m and shear force is 80kN. Use M20 grade concrete and Fe415 steel. (10)

Q8 The plan of a three-storeyed R.C.C school building is shown below. The building is located in seismic zone V. The type of soil encountered is medium stiff and it is proposed to design the building as a moment-resisting frame. The intensity of the dead load is 10 kN/m² and the floors are to cater to an imposed load of 3 kN/m². Determine the design seismic loads on the structure by static analysis. Storey height of each floor is 3.5 m. (10)



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SEVENTH SEMESTER [B.TECH.] DECEMBER 2016

Paper Code: ETEN-419

Subject: Planning & Design of Green Buildings

Time: 3 Hours

Maximum Marks: 75

**Note: Attempt all questions as directed. Internal choice is indicated.
Explain answers with the help of neat sketches wherever necessary.**

- Q1 Attempt **any five** of the following:- (5x5=25)
- (a) Energy Demand for Lifecycle of Building
 - (b) CO₂ Emission Trade
 - (c) Noise Protection in the Building
 - (d) Building Envelope
 - (e) Landscaping of Green building
 - (f) Water Requirement in Green Building
- Q2 (a) Explain the historical development of the concept of green building? (6)
- (b) Describe in detail about the different barriers to be overcome during construction and Commissioning of green building? (7)
- OR**
- Q3 Explain the Rating System in green building? Describe in detail about the LEED rating system for sustainable building? (13)
- Q4 (a) Explain in detail about the various essential requirements of green building? (6)
- (b) Explain how the earth air tunnel system helps in planning and construction of green building? (6)
- OR**
- Q5 (a) Describe the effect of shape and orientation of building in the design of green building? (6)
- (b) Explain various types of green materials and furnishings used in the construction of green building? (6)
- Q6 (a) What are the steps to be followed while planning and construction of green building? (6)
- (b) Explain in detail about various waste materials generated during the construction of green building? (7)
- OR**
- Q7 What points to be considered while selection of the foundation and material while commissioning the green building? (13)
- Q8 (a) How the use of water is minimized for sustainable building? (6)
- (b) Write in detail about the following:- (6)
- (i) Indoor Comfort,
 - (ii) Air Quality
 - (iii) Blower Door Test
- OR**
- Q9 (a) What are the different resources of energy required in green building? (6)
- (b) How consciously are the energy resources used in green building from view point of environment? (6)

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END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH.] DECEMBER 2016

Paper Code: ETCE-401

Subject: Economics for Engineers

Time: 3 Hours

Maximum Marks: 75

Note: Attempt any five questions including Q no. 1 which is compulsory. Internal choice is indicated.

Q1 Write short notes on **any five** of the following: (5x5=25)

- (a) Cross Elasticity of Demand
- (b) Difference between Micro Economics and Macro Economics
- (c) Marginal Utility
- (d) Time Value of Money
- (e) Opportunity Cost
- (f) Conditions of Perfect Competition
- (g) PPP
- (h) Demand Pull and Cost Push Inflation

Q2 Why should engineers study economics? What is its applicability? (12.5)

Q3 What do you mean by Law of Demand? What are the exceptions to Law of Demand? (12.5)

Q4 (a) Break Even Analysis assumes that variable cost and revenue are linear and that fixed cost is fixed constant. Briefly explain it with the help of diagram. (6)

(b) A company's accounting department has the following data:-
Sales: Rs. 1,00,000/- Fixed Cost: Rs. 3,00,000/- Variable Cost: Rs. 50,000/-. Find the breakeven point in terms of sales volume. (6.5)

Q5 (a) What is depreciation? Give two methods of depreciation. (6)

(b) Give depreciation amount for each year by declining method of depreciation by assuming fixed percentage rate of depreciation as 0.2 in the following case:- (6.5)
First Cost: Rs. 1,00,000/- Salvage Value: Rs. 20,000/- Life of Asset: 3 years.

Q6 Explain the main functions of Reserve Bank of India. (12.5)

OR

What is a Bank? What are the functions of commercial Banks in India? (12.5)

Q7 (a) What do you mean by NPV and IRR? How these are helpful in capital budgeting? (6)

(b) The initial outlay and cash flow pattern in case of a company are as under:- (6.5)

Initial Investment: Rs. 1,00,000/- Annual Equal Revenue: Rs. 30,000/- Life of the project: 5 years. Find IRR.

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