Paper Code: ETMS-423

Time: 3 Hours

Subject: Economics for Engineers

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

Maximum Marks: 75

Q1 Attempt **any five** of the following:- **(5x5=25)**
(a) Explain Consumer Equilibrium through Indifference Curve analysis.
(b) Discuss Public Private Partnership (PPP) Model.
(c) Difference between Demand Pull and Cost Push Inflation.
(d) Differentiate Short Run and Long Run Cost.
(e) Differentiate "Shift in Demand" and "Movement along Demand"
(f) What do you mean by Sustainable Development.
(g) Explain Internal Rate of Return.

Q2 (a) Define Economics and explain its relevance to the field of Engineering. **(6.5)**

(b) Discuss Law of Diminishing Marginal Utility with the help of suitable diagram. **(6)**

OR

Q3 (a) Explain the features of Perfect Competition Market Structure. **(6)**
(b) What are factors affecting price elasticity of Demand? **(6.5)**

Q4 (a) Explain the concept of Opportunity Cost. Discuss various elements of cost. **(6)**
(b) Alpha associates have following details: **(6.5)**
Fixed Cost = 2000000
Variable Cost per Unit = 100
Selling price per Unit = 200
Find (i) Break Even sales quantity
(ii) Break Even sales
(iii) If the Actual production quantity is 60,000, find contribution.

OR

Q5 Define the Trading Account, Profit and Loss Account and explain the steps in preparation of Balance Sheet. **(12.5)**

Q6 (a) What do you mean by Store keeping? Discuss its essential elements. **(6.5)**

(b) Difference between Joint Stock Companies and Partnership firms. **(6)**

OR

Q7 Define Banking and explain the functions of a Commercial Bank. **(12.5)**

Q8 (a) Discuss concept of Asset Depreciation. **(6)**
(b) A Company has purchase equipment whose first cost is 100000 with an estimated life of eight year. The estimated salvage value of the equipment at the end of its life time is 20000. Compute the Depreciation and the book value for the period of 5 years. **(6.5)**

OR

Q9 What do you understand by Tax and Subsidy? Explain their relevance for engineering economic decision with suitable illustrations. **(12.5)**

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P

END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] DECEMBER- 2017

Paper Code: ETCE 403   **Subject:** *Irrigation Engineering*

Time : 3 Hours

Maximum Marks :75

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

Q1. Answer **any five** of the following: **(5x5=25)**
- a) What are the different "Canal regulation works"?
- b) What are the application of Khosla's theory?
- c) What are the methods of silt accumulation behind a river regulator?
- d) What are "Cut-offs"? How they used as a method of river training?
- e) What are the causes of failure of gravity Dam?
- f) What are the important of river training methods also mention the purpose for which each type is adopted?

Q2. What are outlets? Enumerate the different type of outlet which are in common use on Canal projects. Describe briefly with a neat sketch the functioning, use and design of "adjustable proportionate module (APM)".

     (12.5)

OR

Find the capacity of reservoir from the following data:

Crop	Base in days	Duty in hect/cumec	Intensity of irrigation
Rice	120	1800	25
Wheat	120	2000	30
Sugarcane	320	2500	20

The culturable command area is 80000 hectare.   **(12.5)**

Q3. What are the functions of canal head regulator? Discuss the general design consideration for it?   **(12.5)**

OR

Design and irrigation canal with the following data: **(12.5)**
- a) Full supplied discharge   =   14 cumecs
- b) Bed slope   =   0.0002
- c) Mannings 'n'   =   0.0225
- d) M   =   1
- e) Side slope   =   ½:1
- f) Assume full supplied depth   =   1.8 meter

Q4. How would you estimate the afflux and the uplift pressure on the roof of the barrel of a siphon aqueduct.   **(12.5)**

OR   **P.T.O.**

Explain different factors and equations governing the design of weir or a barrage? **(12.5)**

Q5. Determine the uplift force at the base of gravity dam of height 30m plus 3m free board, top width 6m and base width is 25m tail water depth is 5m for the following cases. **(12.5)**
 a)   No drains
  b)   With drains and grout curtain at a distance of 5m from the up stream end.

OR

Following figure shows the section of gravity dam (non-overflow portion) built of concrete. Calculate (neglecting earthquack effects):
  a)   The maximum vertical stresses at heel and toe of the dam.
  b)   The major principal stress at the toe of the dam.
  c)   The intensity of shear stress on horizontal plane near the toe.

Assume weight of concrete 23.5 kN/m³ and allowable stress in concrete may be taken as 2500 kN/m². **(12.5)**
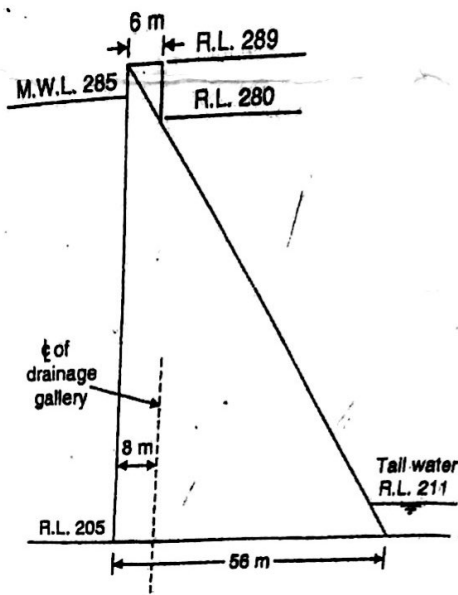
END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] DECEMBER 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 Write short notes on **any five** of the following: - (5x5=25)

a) Types of gauges and types of sleepers.

b) Causes of Railway accidents.

c) Railway movement control systems.

d) Types of waves on harbours and their impact.

e) Safety measures while tunneling.

f) Drainage system requirements at airports.

g) Airport Runway planning and design.

Q2 Mention and explain the various types of railway track designs with respect to speed and gradient. (12.5)

OR

Elaborate the wear and tear of railway tracks and the maintenance requirements of each. (12.5)

Q3 What are the different types of railway stations and railway yards? (12.5)

OR

Explain in detail the salient features in the design of the Delhi Metro, its operation and maintenance. (12.5)

Q4 What are the considerations to be kept in mind while Tunneling? Explain with regards to different soil types. (12.5)

OR

Write in detail about the types of harbours and docks and the importance of each typology. (12.5)

Q5 What criteria should one keep in mind while designing airports and its site selection? Explain with examples. (12.5)

OR

Mention and explain the Environmental and Lighting requirements for airport projects to be considered while designing modern airports. (12.5)

P

END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] 1   · DECEMBER 2017

Paper Code: ETCE-413	Subject: Earthquake Technology
Time: 3 Hours	Maximum Marks: 75

Note: Attempt any five questions including Q.no.1 which is compulsory. Assume any missing data suitably, if not given.

Q1   Attempt **any five** parts of the following:-   (5x5=25)
(a) What is meant by focus and epicentre of an earthquake? Differentiate between two kinds of body waves and explain how they differ?
(b) Give the merits and demerits of the three techniques of the modelling of structures.
(c) Explain drift limitations for buildings as per I.S. codes.
(d) Discuss the factors required for assessing-
    (i) The lateral design forces
    (ii) The design response spectrum
(e) What is the difference between the structural behaviour of long and short shear wall.
(f) Describe the various methods of restoring the earthquake damaged masonry buildings.

Q2   (a) Derive a mathematical expression defining the dynamic displacements using D'Alembert principle.   (6.5)
(b) Briefly describe damping. Also define the type of damping mechanism of structure under earthquake disturbances.   (6)

Q3   Figure shows the frame of a RC building to be constructed in Goa. The spacing of frames is 4.0 m c/c. The floor beams support 120 mm thick masonry wall. Compute the seismic forces.
Data: Size of column = 250 mm x 400 mm
Size of beam = 250 mm x 500 mm
Slab thickness = 120 mm
Weight of concrete = 24 kN/m³
Weight of masonry = 20 kN/m³
LL on roof = 1.5 kN/m²
LL on floors = 5 kN/m²
Assume relevant data, if required.   (12.5)
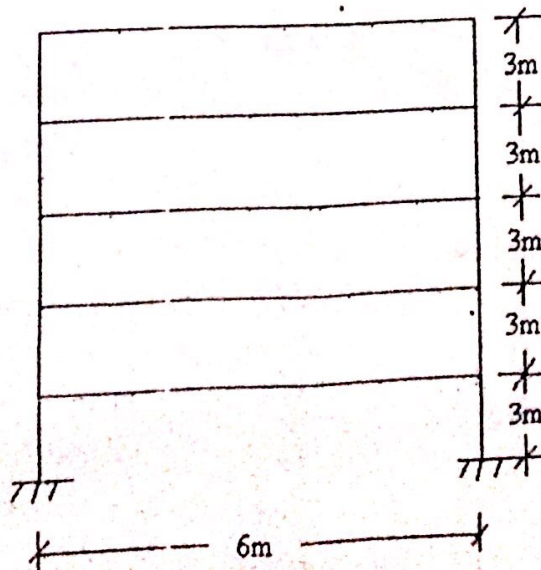
P.T.O.

Q4 Determine the frequency and design seismic coefficient for an ordinary masonry shear wall in a primary health centre at Dehradun, given the following data:
Roof Load = 20 kN/m
Height of wall = 3.5 m
Width of wall = 0.3 m
Unit weight of wall = 20 kN/m³
The building is situated on rocky soil. **(12.5)**

Q5 (a) Explain the design procedure for a 2-storeyed masonry building with example? **(6.5)**
(b) Define 'Shear Walls'. How are these classified? **(6)**

Q6 Explain the Concept of Vibration isolation of Buildings. Write about any four control devices with suitable sketches. **(12.5)**

Q7 A RCC beam of rectangular section has to carry a distributed live load of 20 kN/m in addition to its own weight and a dead load of 25kN/m. The maximum bending moment and shear force due to the earthquake are 60 kNm and 40 kN respectively. Center to Centre distance between supports is 6 m. Design the beam using M-20 grade concrete and Fe 415 steel.**(12.5)**

Q8 Write short notes on the following: **(4+4+4.5=12.5)**
(a) Types of ground failures due to earthquake.
(b) Energy dissipation devices.
(c) Seismic evaluation of buildings.

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END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] DECEMBER 2017

Paper Code: ETEN 419   Subject: Planning and Design of Green Buildings
ETEN 421

Time : 3 Hours   Maximum Marks :75

Note: Attempt any five questions including Q. NO. 1 which is compulsory. Make necessary assumptions wherever required and clearly state them.

Q1. Write short notes on the following: **(5x5=25)**
   a)   Rating system for sustainable building
   b)   Earth Air Tunnel System
   c)   Building orientation
   d)   Alternative building material for green buildings
   e)   Use of waste materials in green buildings

Q2. a)   Explain the LEED rating system and its significance.   **(5)**
   b)   What do you mean by embedded energy of building materials? Explain, with example, how the building materials are to be selected based on this concept.   **(7.5)**

Q3. Explain concept of life cycle engineering with reference to green building and compare the same for conventional building.   **(12.5)**

Q4. Design an earth air tunnel system for moderating air temperature of a residential building located in Delhi, for enclosed floor are of 3000 square metre and having 12 feet average height of the constructed building (consisting of 3 floors of 1000 square metre each) having dimensions of 50x20 metre on each floor. Necessary data for the design may be assumed and clearly stated.   **(12.5)**

Q5. Explain the following the respect to green building
   a)   Integrated design   **(6)**
   b)   Materials for floors and exteriors walls   **(3)**
   c)   Land scaping   **(3.5)**

Q6. What are the re-generative energy resources? With suitable data workout the detailed energy demand for life cycle of a green building as mentioned in Question No. 4.   **(12.5)**

Q7. Write a comprehensive note on design, contruction, commissioning and monitoring for green building. Also indicate, what type of building materials and furnishing will be desired (except floors and exterior walls) in such building.   **(12.5)**

Q8. Write short notes on the following:
   a)   Thermography   **(4)**
   b)   Primary energy demand for indoor climate conditioning   **(4)**
   c)   Barriers to green building growth.   **(4.5)**

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(Please write your Exam Roll No.)

END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] NOVEMBER-DECEMBER 2017

Subject: Economics for Engineers

Paper Code: ETCE-401

Maximum Marks: 75

Time: 3 Hours

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

(5x5=25)

Q1 Attempt any five of the following: -
a) Explain Consumer Equilibrium through Indifference Curve analysis.
b) Discuss Public Private Partnership (PPP) firm.
c) Difference between Demand Pull and Cost Push Inflation
d) Differentiate Short Run and Long Run Cost.
e) Differentiate "Shift in Demand" and "Movement along Demand".
f) What do mean by Sustainable Development.
g) Explain Internal Rate of Return.

Q2 a) Why engineering students should study economics? (6.5)
b) Discuss Law of Diminishing Marginal Utility with the help suitable diagram. (6)

OR

Q3 a) Explain the features of Perfect Competition Market Structure. (6)
b) What are factors affecting price elasticity of Demand? (6.5)

Q4 a) Explain the concept of Opportunity Cost. Discuss its various elements of Cost. (6)
b) Alpha associates have following details: (6.5)
Fixed Cost = 2000000
Variable Cost per Unit = 100
Selling price per Unit = 200
Find: a) Break Even sales quantity
b) Break Even sales
c) If the Actual production quantity is 60,000 than find Contribution.

OR

Q5 Define the Trading Account, Profit & Loss Account, write steps to prepare Balance Sheet. (12.5)

Q6 a) What do you mean by Store keeping? Discuss its various essential elements. (6.5)
b) Differentiate between Joint Stock Companies and Partnership. (6)

OR

Q7 What do you mean by Banking? Explain the various functions performed by Reserve Bank of India. (12.5)

Q8 a) Discuss concept of Asset Depreciation (6)
b) A Company has purchased equipment whose first cost is 100000 with an estimated life of eight year. The estimated salvage value of the equipment at the end of its life time is 20000. Compute the Depreciation and the book value for the period of 5 years. (6.5)

OR

Q9 What implications does Tax and Subsidies have for Engineering Economic Decision? Explain with the help of examples. (12.5)