AR13

CODE: 13CE3020 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH II SEM REGULAR EXAMINATIONS, MAY, 2016

EARTHQUAKE RESISTANT DESIGN
(ELECTIVE – I)
(CIVIL ENGINEERING)

TIME: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 X 10 = 10M]**

1.
   a) What is meant by damping?
   b) What is a fundamental mode?
   c) Define single degree of freedom system.
   d) Write the equation of motion for a free undamped vibration of spring mass system.
   e) What are faults?
   f) What is base isolation?
   g) What is the intensity of earthquake?
   h) What are different types of seismic waves?
   i) What is the code used for ductile detailing of earthquake resisting reinforced concrete structures?
   j) Differentiate between forced and free vibrations of multi-degree of freedom system.

PART B

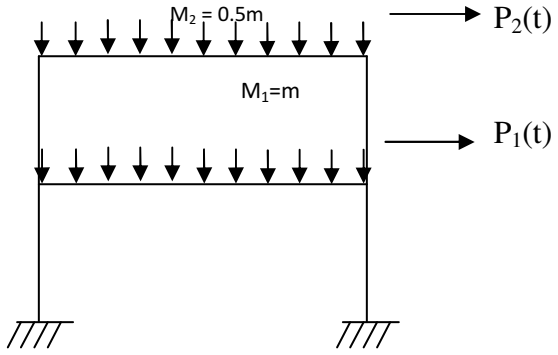
Answer one question from each **[5 x 12=60M]**

UNIT – I

2. a) Explain the response of harmonic excitation of single degree of freedom system
   b) Explain response spectrum analysis? Discuss in brief?

(OR)

3. a. Explain the orthogonality of modes.
   b. Compute the response due to harmonic loading for the shear frame shown for the given data, EI=24x10^6 Nm^2, m=500x10^3, $P_1(t)=0$, $P_2(t)=(10000 \sin 30t)$ kN, storey height=3m.



Stiffness of all columns is "k".

UNIT – II

4. Derive the equation of motion for the free vibration of an 2 - DOF system.

(OR)

5. A two storey shear frame has the mass of first storey equal two times of second storey and stiffness of second storey is half of first storey. Determine the modal expansion of the effective earthquake force distribution along with the horizontal ground acceleration $u_g(t)$.

UNIT – III

6. Explain the design procedure by seismic coefficient and response spectrum methods.

(OR)

7. Explain the provisions for the design of reinforced concrete structures for earthquake resistance according to IS:1893-2002. Also discuss the basic assumptions from the code.

UNIT – IV

8. What do you understand by engineering seismology? Explain the phenomenon of earthquake and its causes and effects in brief.

(OR)

9. Describe briefly about plate tectonics. Explain Elastic Rebound Theory.

UNIT – V

10. Explain with neat sketch the design criteria required by a member for longitudinal reinforcement and shear reinforcement as per IS:13920-1993 for beams.

(OR)

11. Under what conditions do we provide ductile detailing in any structure? Also mention factors increasing ductility.

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CODE : 13CE3021 **SET - 2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III YEAR B.TECH II SEM REGULAR EXAMINATIONS, MAY, 2016

Industrial waste and waste water management

(Elective I)

(CIVIL ENGINEERING)

Time : 3 Hours **Max marks : 70**

PART A

ANSWER ALL THE QUESTIONS **[1 x 10 = 10 M]**

1 a) When do you call a waste as hazardous waste ?
b) List down the various options available for disposal of industrial wastes ?
c) Distinguish between leachate and landfill ?
d) List down various common treatment methods being adopted in industrial waste water treatment ?
e) What are the major pollutants in waste water generated from pulp and paper industry ?
f))What are the major pollutants in waste water generated from fertilizer industry ?
g) List down any three advantages of common effluent treatment plant ?
h) List down important chemical treatment methods being adopted in industrial waste water treatment ?
i) What do you understand about volume reduction in industrial waste water management?
j)State one principle difference between domestic waste water and industrial water ?

PART B

Answer one question from each unit **[5 x 12 = 60 M]**

UNIT-I

2.Give a brief note on principles of treatment of industrial waste ?

(OR)

3.Give a brief note on properties, treatment and disposal of bio medical waste ?

UNIT-II

4.Give a brief note on neutralization technique being adopted in industrial waste water treatment ?

(OR)

5.What do you understand about joint treatment of domestic sewage and industrial waste water and what are the problems associated ?

UNIT-III

6.Discuss the scope of utilization of municipal waste water in industries ? Also present the advantages and limitations ?

(OR)

7.Present any case study of disposal of industrial waste water in to water bodies and its impact on the environment in your region ?

UNIT-IV

8.a) Present schematic diagram of manufacturing process of cotton textile industry and operations that generate waste water ?
b) Elaborate on treatment of waste water of cotton textile industry ?

(OR)

9.a) Elaborate on treatment of waste water of pharmaceutical industry ?
b) Elaborate on treatment of waste water of distilleries industry ?

UNIT-V

10.Give a brief note on suitability of common effluent treatment plants for treatment of industrial waste water of a industrial estate and state the limitations ?

(OR)

11. What do you understand about zero discharge and give a brief note on disposal methods of industrial effluents ?

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CODE: 13CE3023 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.TECH II SEM REGULAR EXAMINATIONS, MAY, 2016

PRESTRESSED CONCRETE
(CIVIL ENGINEERING)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Define pre-tensioning system
   b) For what spans Pre-stressing is economical
   c) List out the losses that occurs in post tensioned member in addition to Pre-tensioned members
   d) What type of stresses are induced by Eccentric tendons in concrete beams .
   e) In which system the moment of resistance is more
   f) The maximum spacing of the stirrups in a pre-stressed beam
   g) Why the composite section is economical
   h) In composite members where the prestressed elements are used for its advantage
   i) At what stage deflection of prestressed concrete is more
   j) What will be the deflection shape of the beam subjected to parabolic tendon with maximum eccentricity at centre and concentric at support.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a What is the minimum concrete strength requirements prescribed for pre-stressed concrete members as per IS code. 4M
   b Explain with a neat sketch any one method of Post –tensioning system. 8M

(OR)

3. a Distinguish between 'pre tensioning' and 'post tensioning' methods of pre-stressing. 4M
   b Explain with a neat sketch Hoyers long line system of pre- tensioning. 8M

UNIT-II

4. a How do you compute the loss of stress due to elastic deformations of concrete. 4M
   b A pre tensioned beam 200 mm wide and 300 mm deep is pre-stressed by 10 wires of 7 mm diameter initially stressed to 1200N/mm^2 with their centroids located 100mm from the soffit. Find the maximum stress in concrete after transfer, allowing only for elastic shortening of concrete. If the concrete undergoes a further shortening due to creep and shrinkage while there is a relaxation of 5% of steel stress, estimate the final percentage loss of stress in the wires using IS Code:1343 by considering the following data: Es = 210Kn/mm^2, Ec =5700(fcu)$^{1/2}$, fcu = 42 N/mm^2, ø = 1.6, Total residual shrinkage strain = 3*10^{-4}. 8M

(OR)

5. A rectangular concrete beam 100 mm wide x250mm deep spanning over 8 m prestressed by a straight cable carrying an effective pre-stressing force of 250 kN at an eccentricity of 40 mm . The beam supports a live load of1.2 kN/m. 12M
   i) Calculate the resultant stress distribution for the centre of span cross section of the beam
   ii) Find the magnitude of pre-Stressing force with an eccentricity of 40 mm which can balance the stress due to dead load and live load at the soffit of the center span of the section.

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UNIT-III

6. The support section of a pre-stressed concrete beam 100 mm wide and 250 mm deep is required to support an ultimate shear force of 60 kN . the compressive prestress at the centroidal axis is 5 N/mm^2.The characteristic cube strength of concrete is 40 N/mm^2. The cover to tension reinforcement is 50 mm . if characteristic tensile strength of steel is 250 40 N/mm^2. Design suitable Shear reinforcement at the section. 12M

(OR)

7. The end block of a pre-stressed concrete beam of rectangular section,100 mm wide and 200 mm deep Using Guyons method compute the position and magnitude of maximum tensile stress and bursting tension for the end block with concentric anchoring force of 100kN transmitting to concrete by a distribution plate 100 mm wide and 50 mm deep 12M

UNIT-IV

8. A Composite T- beam is made up of pre-tensioned rib 150 mm wide and 250 mm deep , and a cast in situ slab 450 mm wide and 50 mm thick having a modulus of elasticity 28 kN/mm^2. If the differential shrinkage is 100 x 10^{-6} units . Determine the shrinkage stresses developed in pre-cast and cast- in situ units. 12M

(OR)

9. A pre stressed pre tensioned beam of rectangular section has a breadth of 100 mm and depth of 200 mm with an effective span of 5 m is prestressed by tendon with their centroids coincide with the bottom kern. The initial force in the tendon is 150 kN. The loss of prestress may be assumed to be 15% .The beam is incorporated in a composite T-beam by casting top flange of breadth 400 mm and thickness 40 mm.if composite beam supports a live load of 8 kN/m^2 . Compute the resultant stresses developed in the precast pre-tensioned beam and cast in situ slab for the propped case . If the modulus of elasticity of concrete in slab and beam are different assume Ec =35 kN/mm^2 12M

UNIT-V

10. a A Rectangular concrete beam having 150 mm wide and 400 mm deep is pre-stressed by a parabolic cable carrying an initial force of 300 kN. The cable has an eccentricity of 50 mm at centre of span and concentric at supports. If the span of beam is 12 m and live load is 2kN/m, estimate the short term deflection at centre of span. Assume E = 35 kN/mm^2 ø (creep coefficient) as 2.0 and loss of prestress is 20% of initial stress after 6 months. Estimate long term deflections at the centre of span at this stage, assuming that dead load and live load are simultaneously applied the release of pre-stress. Density of concrete is 24kN/m^3. 8M

b List the various factors influencing the deflection of prestressed concrete members 4M

(OR)

11. A Rectangular concrete beam having 100 mm wide and 300 mm deep is pre-stressed by three cables, each carrying an effective force of 240 kN. The span of beam is 10 m . The first cable is Parabolic with an eccentricity of 50 mm at centre of span and 50 mm above the centroidal axis at supports. The second cable is Parabolic with an eccentricity of 50 mm at centre of span and zero ecentricity at supports. The third cable is straight with a uniform eccentricity of 50 mm below the centroidal axis If beam supports a live load of 5kN/m, estimate the instantaneous deflection at the following stages 12M

i) Prestress and Self weight of the beam ii) Prestress , Self weight and live load of the beam

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AR13

CODE: 13ME3025 SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TEKKALI
(AUTONOMOUS)
III B.TECH II SEM REGULAR EXAMINATIONS, MAY-2016

AUTOMOBILE ENGINEERING
(Mechanical Engineering)

Time: 3 Hours **Max Marks: 70**

PART –A

ANSWER ALL QUESTIONS **[1x10=10M]**

1. a) State the functions of automobile transmission system.
   b) What is the purpose of lubricant?
   c) What is the function of carburetor?
   d) What is the function of fuel pump?
   e) What is the function of radiator?
   f) What are the requirements of ignition system.
   g) What is the function of generator?
   h) What is the function of gear box?
   i) What are the types of steering mechanism?
   j) What is the function of brakes?

PART-B

Answer one question from each unit **[5X12=60M]**

UNIT-I

2. How do you classify automobiles? Explain in details giving examples.

(OR)

3.a) Discuss various methods to reduce the emission of pollutions in exhaust gasses.

b) What is closed crank ventilation? Describing the construction and working principle of the PCV valve under various conditions.

UNIT-II

4. With help of neat sketches, explain the construction and working of mechanical fuel pumps.

(OR)

5. Explain the construction and the working of single cylinder jerk pump type fuel injection pump with a neat sketch.

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CODE: 13ME3025 SET-2

UNIT-III

6. Name different methods of engine cooling. Explain in details the air cooling methods.

(OR)

7. Explain the construction and the working principle of Bendix drive.

UNIT-IV

8. Explain the construction and the working principle of epicyclic gearbox.

(OR)

9. Explain the construction and the working principle of cluctch.

UNIT-V

10. a) Discuss in details the Ackermann steering mechanism.

    b) The front axle of a car has pivot length 1.1m, the length of each steering arm is 150mm, while the track rod is of 1m length , calculate the wheel base for perfect rolling of the car wheels when the inner wheel stub axle is at 55^0 to the rear center line.

(OR)

11. Explain the construction and the working principle of torsion bar.

8. Explain the construction and the working principle of epicyclic gearbox.

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CODE: 13CS3025 SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TEKKALI
(AUTONOMOUS)
III B.TECH II SEM REGULAR EXAMINATIONS, MAY,2016

ADVANCED COMPUTER ARCHITECTURE
(Computer Science Engineering)

Time:3 Hours **Max.Marks:70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10=10M]**

1 a) Define the terms Parallelism and Pipelining?
b) Explain about the importance of nodes in distributed –memory multi computers/processors?
c) Define the page and page fault?
d) Mention the basic memory hierarchy?
e) Define the linear and non-linear pipeline processors?
f) Define the terms clocking and timing control?
g) Define the Hot-Spot Problem?
h) Define about circuit switching?
i) Describe any two cache coherence problems?
j) What do you mean by flow control strategies?

PART-B

Answer one question from each unit **[5 x 12=60M]**

UNIT-I

2 a) Write a brief description about the current state computing? 6M
b) Describe the System Attributes to performance in detail? 6M

(OR)

3 a) Differentiate between Multiprocessors and Multicomputers? 6M
b) Write a short notes on Shared Memory and Distributed Memory Multi-Processors? 6M

UNIT-II

4 a) Draw a neat sketch about Memory Hierarchy Design and explain in detail? 6M
b) Explain the Pipelined Cache access to increase Cache Bandwidth mechanism? 6M

(OR)

5 a) Explain about small and simple first level cache to reduce power? 6M
b) Write importance of Non-blocking cache thoroughly? 6M

UNIT-III

6 Differentiate between the Linear and Non-Linear Pipeline Processors in all means? 12M

(OR)

7 Explain the following in Non-Linear Pipeline Processors:-
i) Reservation and latency analysis problems 12M
ii) Collision free scheduling problems

UNIT-IV

8 Differentiate between the Multiprocessors and Multivector Computers briefly? 12M

(OR)

9 Write a short notes on (i) Multivector Computers-Vector Instruction types
(ii) Vector Processing Principles 12M

UNIT-V

10 Explain thoroughly Cache Coherence and Message Passing mechanisms? 12M

(OR)

11 a) Message Routing Schemes 6M
b) Deadlock Virtual Channels 6M

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CODE: 13IT3006 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH II SEM REGULAR EXAMINATIONS, MAY, 2016

IMAGE PROCESSING
(INFORMATION TECHNOLOGY)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Define Digital Image Processing?
   b) List out the different Gray Level Transformation functions?
   c) Define Redundancy?
   d) Define Reflection?
   e) What is Segmentation?
   f) Define Sampling?
   g) List out any four Morphological Algorithms?
   h) Define Thresholding?
   i) What is Predictive Coding?
   j) Define Region Splitting?

PART-B

Answer one question from each unit **[5 x 12=60M]**

UNIT-I

2. Explain in detail the examples of fields that use Digital Image Processing. [12M]

(OR)

3. Explain in detail the components of an image processing system. [12M]

UNIT-II

4. What is Histogram Equalization? Explain the possible functions along with statistics of T(r) and L-1. [12M]

(OR)

5. Explain about spatial filtering and smoothing spatial filter. [12M]

UNIT-III

6. What is Compression? Explain LZW coding with an example. [12M]

(OR)

7. Explain the different types of compression techniques. [12M]

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CODE: 13IT3004 **SET-I**

UNIT-IV

8. Explain following components with example
   a) Erosion [4M]
   b) Dilation [4M]
   c) Properties of Opening operation [4M]

(OR)

9. Explain following components with example
   a) Region filling [4M]
   b) Boundary Extraction [4M]
   c) Thinning [4M]

UNIT-V

10. What is Thresholding? Explain Optimal and Global Thresholding. [12M]

(OR)

11. What is Region-based segmentation? Explain Basic formulation and region growing. [12M]

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