

AR13

CODE: 13CE3017

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech II Semester Supplementary Examinations, July- 2016

**GEOTECHNICAL ENGINEERING -II
(CIVIL ENGINEERING)**

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Distinguish clearly between disturbed and undisturbed soils.
b) Define SPT blow count, N .
c) Distinguish clearly between 'slope failure' and 'base failure' in finite slopes with sketch.
d) The critical condition for downstream slope of earth dam is _____
e) Distinguish clearly between active and passive earth pressures.
f) What is depth of tension zone in a saturated clay soil ($\phi_u = 0$) with $\gamma = 20 \text{ kN/m}^3$ and unconfined compressive strength of 80 kN/m^2 ?
g) When will you provide 'raft/mat foundation'?
h) Define 'Safe bearing capacity' of shallow foundation.
i) Mention major limitation of dynamic formulae.
j) What is reliable method to determine pile capacity?

PART-B

Answer one question from each unit

[5 x 12=60M]

UNIT-I

2. a) Describe the "Standard Penetration Test" used in soil exploration. Explain the corrections to be applied to SPT blow count ' N ' 6M
b) What is the purpose of pressure meter test? Explain how can you conduct the test. 6M
(OR)
3. a) Explain limitations in 'plate load test' 6M
b) Briefly explain how you will prepare 'soil investigation report'? 6M

UNIT-II

4. a) Derive the formula for purely frictional soils in infinite slopes in the case of when seepage occurs along the slope. 6M
b) An infinite slope is made of clay with the following properties: Bulk unit weight $= 18 \text{ kN/m}^3$, Sub. unit weight $= 9 \text{ kN/m}^3$, cohesion $= 25 \text{ kN/m}^2$, angle of internal friction $= 28^\circ$. If the slope has an inclination of 35° and height equal to 12m, determine factor of safety of the slope, when (i) the slope is submerged, and (ii) there is seepage parallel to the slope 6M
(OR)
5. a) Explain Bishop's simplified method of stability of slopes. 6M
b) Calculate the factor safety with respect to cohesion, of a clay slope laid at 1 in 2 to a height of 10 m, if the angle of internal friction $\phi = 10^\circ$. $c = 25 \text{ kN/m}^2$ and $\gamma = 19 \text{ kN/m}^3$. What will be the critical height of slope in this soil. Assume stability no. $S_n = 0.064$. 6M

UNIT-III

6. a) Explain assumptions in Rankine's theory of earth pressure. 6M
b) A retaining wall 6 m high, vertical back, supports a saturated clay soil with a horizontal surface. The properties of the backfill are $\phi_u=0$, $c_u = 35 \text{ kN/m}^2$, $\gamma = 17 \text{ kN/m}^3$. Assuming the back of wall to be smooth, determine the total active thrust against the wall and its point of application, if cracks are formed in the tension zone. 6M

(OR)

7. a) Briefly explain assumptions in Coulomb's theory of earth pressure. 6M
b) Explain with neat sketch 'Culmann's graphical method' for active case with purely frictional soil. 6M

UNIT-IV

8. a) Explain assumptions in Terzaghi's theory of bearing capacity 6M
b) A rectangular footing 2 m x 3.5 m, is placed at a depth of 1.5 m below ground surface. Determine both by Terzaghi as well as IS:6403-1981 recommendations, the net load that can be supported by the footing with a factor of safety of 2.5. The soil properties are $c = 20 \text{ kN/m}^2$ and $\phi = 22^\circ$. 6M

(OR)

9. a) Briefly explain location & depth of shallow foundations 6M
b) A square footing 1.2 m wide is located at a depth of 1.5 m in non-cohesive soil deposit for which the corrected N-value of SPT is 20. Water table is located at 2 m below the ground surface. Find the allowable bearing pressure for the soil. 6M

UNIT-V

10. a) Explain briefly how you can determine pile capacity for cohesionless soils by static formula. 6M
b) A group of 9 piles, 8 m long is used as the foundation for a column. The piles are 30 cm diameter with centre to centre spacing of 90 cm. The sub-soil consists of clay with unconfined compressive strength of 180 kN/m^2 . Estimate the safe load ($F.S = 3.0$). 6M

(OR)

11. a) Explain how can you conduct pile load test with neat sketch and also explain determination of pile capacity from test data. 6M
b) Explain how can you determine settlement of pile groups in the case of frictional pile group. 6M

AR13

CODE: 13EE3019

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech II Semester Supplementary Examinations, July- 2016

**UNIX & SHELL PROGRAMMING
(ELECTIVE – I)
(Electrical and Electronics Engineering)**

Time: 3 Hours

Max Marks : 70

PART- A

ANSWER ALL QUESTIONS

[1 X 10 = 10M]

1. (a) How do you login a session with unix?
(b) Write about man command.
(c) Define telnet.
(d) Write notes on file handling
(e) What is shell? List out different types of shells
(f) How to identify duplicate lines in files
(g) Write about Exit status of a command
(h) Write notes on script debugging
(i) Discuss about selection and repetition.
(j) Write about features of C shell.

PART- B

Answer one question from each unit

[5 x 12 = 60 M]

UNIT – I

2. (a) Describe briefly the UNIX architecture and explain the role played by the kernel and shell in sharing the work load.
(b) Explain the reasons for popularity and success of Unix system
(OR)
3. (a) Explain the following commands with examples
i) echo ii) script iii) who iv) date v) cd vi) cp
(b) Explain briefly absolute pathname and relative path name with examples.

UNIT – II

- 4.(a) Write how protection is ensured for files in UNIX
(b) Write the features of VI editor
(OR)
- 5.(a) Explain briefly about networking utilities.
(b) Explain the following commands with examples
i) umount ii) ulimit iii) arp iv) mount

UNIT – III

- 6.(a) Explain sort command briefly and also discuss about its important options with examples.
(b) Explain with an example use of different quotes.
(OR)

- 7.(a) Explain about filters and pipes with examples.
(b) Describe the concepts of concatenating files and comparing files with examples

UNIT – IV

- 8.(a) Explain about interactive kernel shell and its features.
(b) Discuss about startup scripts in korn shell with examples

(OR)

- 9.(a) Explain about changing position parameters in korn shell programming.
(b) Write notes on eval command with example.

UNIT - V

- 10.(a) Discuss about basic concepts of C shell programming.
(b) Explain about argument validation in C shell.

(OR)

- 11.(a) Explain about environment variables in C shell?
(b) Discuss about command execution process in C shell.

PART-A**ANSWER ALL QUESTIONS****[1×10=10M]**

1. (a) State and explain Newton's law of cooling?
(b) Explain geometric mean area as applied to a hollow sphere?
(c) Define terms fin efficiency and effectiveness?
(d) What is lumped system?
(e) Sketch Thermal and Hydraulic boundary layer when heat flows over a flat plate?
(f) What is significance of Nusselt number?
(g) Why heat transfer is more in nucleate boiling than in film boiling?
(h) What is meant of fouling factor? Explain?
(i) Write about radiation shields?
(j) State Stefan –Boltzman law?

PART-B**Answer one question from each Unit****[5 × 12=60M]****UNIT-I**

2. a) State and explain the modes of heat transfer? [4 M]
b) Derive the general heat conduction equation for cylindrical coordinates? [8 M]
(OR)
3. a) Derive the general heat conduction equation for Cartesian coordinates? [6 M]
b) A composite slab consist of 250 mm fire clay brick (1.09 W/m K) inside, 100 mm fired earth brick (0.26 W/m K) and outer layer of common brick (0.6 W/m K) of thickness 50 mm. If inside surface is at 1200°C and outside surface is at 100°C, Find the heat flux, temperature of the junctions and temperature at 200 mm from the outer surface of the wall? [6 M]

UNIT-II

4. a) Consider a long cylindrical rod, possessing radioactive material of radius 5cm and thermal conductivity 10 W/m K, generating heat uniformly within itself at a constant rate of 3×10^5 W/m³. The rod is cooled by convection with its cylindrical surface into the ambient fluid at 50°C with heat transfer coefficient of 60 W/m²K. Determine, driving the relevant formulate the temperatures at the center of the rod along the outer surface of the rod? [6 M]
b) Derive a expression for temperature distribution and heat transfer rate for long a fin? [6 M]
(OR)
5. a) Derive the expression for temperature distribution and heat transfer of the un-steady state system with negligible internal thermal resistance in comparison to surface resistance? [6 M]
b) What are the Heisler charts? Explain their significance in solving transient conduction problems? [6 M]

UNIT-III

6. a) Explain the concept of velocity boundary layer theory over a flat plate with neat sketch? [5 M]
b) Air at 20°C and 1 bar is flowing over flat plate if the plate is 280 mm wide and at 60°C, calculate hydraulic boundary layer thickness and local friction coefficient, average friction coefficient, shear stress due to friction, local and average heat transfer coefficient and heat transfer rate? [7 M]

(OR)

7. a) Define Reynolds, Nusselt, Prandtl and Stanton numbers. Explain their importance in convective heat transfer? [6M]
b) A water heating system consists of a thick walled tube having OD 40mm and ID 20mm. The outer surface of the tube is insulated and electrical heating within the wall provides a uniform generation rate of 106 W/m^3 . Water at a rate of 0.1 kg/s enters at 20°C and leaves at 60°C . Calculate the length of the tube to get the desired outlet temperature of water? [6 M]

UNIT-IV

8. a) A vertical wall at uniform temperature of 185°C is exposed to a quiescent atmospheric air at 30°C . The wall is height 3.5 m and width 2 m. Calculate the net rate of convection heat transfer from the both sides of the wall into the atmospheric air? [6 M]
b) Discuss briefly the various regimes in boiling heat transfer? [6 M]
(OR)
9. a) What are the fouling factors ? Explain their effects in heat exchanger design? [4 M]
b) An oil cooler, of the concentric tube type is used for cooling oil at 65.6°C to 54.4°C with water available at 26.7°C with a temperature rise of 11.1°C . Assuming the overall heat transfer coefficient of $738 \text{ W/m}^2\text{K}$ based on the outside area of the tubes diameter. Determine the heat transfer surface area required for a design heat load of 190.5 kW for a single pass
i) Parallel flow mode ii) counter flow mode? [8 M]

UNIT-V

- 10.a) State and explain Kirchhoff's identity? What are the conditions under which it is applicable? [5 M]
b) Two concentric cylinders having diameters of 10 cm and 20 cm are placed in a large room maintained at 30°C . The length of the cylinders is 10 cm and the inner cylinder is maintained at 700°C with an emissivity of 0.6. The outer cylinder is perfectly insulated and has an emissivity of 0.7. Calculate the heat lost by the inner cylinder. [7 M]
(OR)
11. a) Define radiation intensity . Prove that the intensity of radiation is given by $I_b = E_b/\pi$ [6 M]
b) Two very large parallel planes with emissivities 0.3 and 0.8 exchange heat by radiation. Find the percentage reduction in heat transfer when polished aluminum radiation shield of emissivity 0.04 is placed between them. [6 M]

AR13

CODE: 13EC3022

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, July- 2016

TV AND SATELLITE COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What is a raster?
b) What is ghost?
c) What is aspect ratio?
d) What is photoconductivity?
e) Classify colour TV receiver systems.
f) What are the merits of PAL system?
g) What is colour killer circuit?
h) List the orbital elements.
i) What is Equivalent Isotropically Radiated Power (EIRP)?
j) What is transponder?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) What is interlaced scanning? Show that it reduces flicker and conserves bandwidth. 6M
b) What do you understand by vertical and horizontal resolution? Show that the highest modulating frequency that needs to be handled in the 625 TV system is 5 MHz. 6M
- (OR)
3. a) What do you understand by positive and negative modulation ? Justify the choice of negative modulation for TV transmission. 6M
b) Justify the need for pre- and - post equalizing pulses. Why is it necessary to keep their duration equal to the half -line period? 6M

UNIT-II

4. a) Describe basic principle of a colour camera with the help of suitable diagrams. Explain why dichroic mirrors are used in the camera optics. 6M
b) Draw block diagram of a PAL encoder and explain how the composite colour signal is formed. 6M
- (OR)
5. a) Explain how the luminance and colour difference signals are developed from camera outputs. Why is it necessary to set $Y = 0.3R + 0.59G + 0.11B$? 6M
b) What are the drawbacks of a delta - gun tube? Explain P.I.L. tubes how it is different from a delta-gun colour tube? 6M

UNIT-III

6. Draw block diagram of a monochrome TV receiver and briefly review the nature of input and output signals at various sections. 12M
- (OR)
7. a Draw block diagram of the Y channel of the colour receiver and label it. Explain the need of delay line in the path of Y signal. 6M
- b Explain fully how the chrominance and luminance signals are separated by a comb filter without any loss of chroma and Y signal bandwidth. 6M

UNIT-IV

8. Write a brief history of satellite system and give applications of satellite communication. 12M
- (OR)
9. Draw the eclipse geometry and explain Orbital effects in communications systems performance. 12M

UNIT-V

10. Draw the typical tracking, telemetry, command and monitoring satellite system. Explain functionality in detail. 12M
- (OR)
11. Draw block diagram of double conversion transponder explain its operation. Justify why the uplink and downlink frequency are different. Explain major frequency bands used in satellite communication. 12M

AR13

CODE: 13CS3025

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech II Semester Supplementary Examinations, July- 2016

**ADVANCED COMPUTER ARCHITECTURE
(Computer Science Engineering)**

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Write the equation for calculation total execution time of a program
b) What is meant by NUMA model
c) Write the equation for average memory access time
d) Mention any two mechanisms to reduce cache miss rate
e) What do you mean by forbidden latency
f) What is the use of collision vector in scheduling nonlinear pipeline
g) Write the atomic operation of Fetch & Add
h) What is the use of masking register
i) Write the disadvantage of Snoopy Bus protocol
j) What is meant by virtual channel

PART-B

Answer one question from each unit

[5 x 12=60M]

UNIT-I

2. a) With a neat sketches explain elements of modern computer 6M
b) Explain the Flynn's classification of computer architectures 6M
(OR)
3. a) Explain about generic model of message-passing multicomputer 6 M
b) Write in detail about Bell's taxonomy of MIMD computers 6M

UNIT-II

4. a) Introduce the memory hierarchy design. 7M
b) Explain about small and simple first level cache to reduce hit time. 5M
(OR)
5. a) Explain in detail about the pipelined cache access to increase bandwidth. 4M
b) Explain about the non-blocking cache to increase cache band width. 8M

UNIT-III

6. a) With a neat sketches explain the models used to implement linear pipeline processor 6M
b) Explain how speedup, Efficiency and throughput is measured for linear pipeline processor 6M
(OR)
7. With an example explain how instruction execution is completed in various phases using Instruction pipeline 12M

AR13

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SET-1

UNIT-IV

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|-------------|----|--|-----|
| 8. | a) | With a neat sketch explain the generalized multiprocessor system | 4M |
| | b) | Explain briefly about Crossbar switch and multiport memory | 8M |
| (OR) | | | |
| 9. | | Explain in detail about Vector Instruction types | 12M |

UNIT-V

- | | | | |
|-------------|----|---|----|
| 10. | a) | Explain about Cache coherence problem | 4M |
| | b) | Explain briefly about Directory-based protocol | 8M |
| (OR) | | | |
| 11. | a) | Explain message-routing schemes used in the multicomputer | 8M |
| | b) | With a neat sketches explain about deadlock avoidance | 4M |

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AR13

CODE: 13IT3006

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech II Semester Supplementary Examinations, July- 2016

IMAGE PROCESSING

(Information Technology)

Time: 3 Hours

Max Marks: 70

PART-A

Answer all Questions

[1 x 10=10M]

1. a) What is digital image processing, what are the various fields that use digital image processing.
b) What are the components of Image processing system.
c) Explain about Enhancement using Arithmetic/Logic operations
d) Explain about smoothing of spatial filters, smoothing of linear and order-statistics filters.
e) What are two main types of Data compression?
f) What are the operations performed by error free compression
g) Explain about Hit or Miss Transformation.
h) Explain about Boundary Extraction Algorithm, Region Filling Algorithm.
i) What are the various methods of thresholding in image segmentation?
j) What is the principle of region growing based image segmentation?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) What is a frame buffer? Discuss the categories of digital storage for image processing applications. **6 M**
b) Describe in detail about the elements of digital image processing system. **6 M**
(OR)
3. a) Explain Optimum mean square quantizer? **8 M**
b) Write short notes on sampling and quantization **4 M**

UNIT-II

4. Explain the types of gray level transformation used for image enhancement. **12 M**
(OR)
5. a) What are image sharpening filters? Explain the various types of it. **6 M**
b) . Explain spatial filtering in image enhancement. **6 M**

UNIT-III

6. a) What is data redundancy? Explain three basic data redundancy? **6 M**
b) Explain about Image compression model? **6 M**
(OR)
7. Explain the different types of compression techniques **12 M**

AR13

CODE: 13IT3006

SET-2

UNIT-IV

8. a) What are the logical operations involving binary images. **6 M**
b) Explain about boundary extraction and region filling. **6 M**
(OR)
9. a) Explain about convex hull, thickening, thinning. **6 M**
b) Explain about extraction of connected components. **6 M**

UNIT-V

10. a) What is the use of boundary characteristics in image segmentation **6 M**
b) Explain about thresholds based on several variables **6 M**
(OR)
11. a) Explain about i) Region-Based Segmentation, ii) Region Growing. **6 M**
b) i) Region Splitting ii) Merging. **6 M**

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