AR13

CODE: 13CE3017 SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, October-2021

GEOTECHNICAL ENGINEERING-II
(Civil Engineering)

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

PART-A

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

1. a) What is the objective of soil exploration?
   b) What is soil sampling?
   c) How do you distinguish a finite slope from an infinite slope?
   d) What is meant by slope factor of safety?
   e) Write down the formula for coefficient of earth pressure at rest.
   f) Write the expression for depth of tension crack in c-ϕ soils.
   g) Define a shallow foundation.
   h) Define ultimate bearing capacity.
   i) Give Engineering News-formula for the allowable load on the pile.
   j) What is the meaning of 'efficiency' of a pile group?

PART-B

Answer one question from each unit

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) What are different boring methods of subsoil exploration? Explain wash boring method. 6M
   b) What are the IS recommendations for soil samplers and also for soil sample disturbance? 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 kN/m3, Sub.unit weight = 9 kN/m3, cohesion = 25 kN/m2, angle of internal friction = 28o. If the slope has an inclination of 35o 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) How do you estimate the earth pressure in cohesive soils? Derive an expression for the Rankine's active earth pressure. 6M
   b) A 6.5 m high vertical retaining wall supports a back fill with horizontal upper surface. The top 2.5 m of the fill is clay with unit weight 18 kN/m^3, cohesion 10 kN/m^2 and angle of internal friction 18^0. The bottom 4 m of the fill is sand with unit weight 20 kN/m^3 and angle of internal friction 24^0. Determine the total active earth pressure per meter length of the wall and its point of application after neglecting negative pressure. 6M

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UNIT-III

6. a) Derive an expression for the factor of safely of infinite slope in dry cohesionless soils. 6M

   b) An unsupported slope has a radius of 24m, angle subtended at the centre is 65^0, slope angle is 50^0, weight of the wedge is 2500kN and the centroid distance of the wedge is 11m. If the height of the slope is 14m, determine the factor of safety against sliding for the trail slip circle assuming $c=50kN/m^2$, $\phi=0^0$. 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 the Terzaghi's bearing capacity theory with the help of neat sketch and derive the suitable formulae? 6M

   b) A square footing rests on pure clay with unconfined compressive strength of $270kN/m^2$ at a depth of 1.8m. Determine the size of the footing if it has to transmit a load of 720kN. Assume the bulk unit weight of soil as $18kN/m^3$ and factor of safety as 3.0. 6M

(OR)

9. a) Briefly outline the plate load test method of determining the safe bearing capacity of soils. What are its limitations? 6M

   b) Describe permissible limits of settlements for settlement of shallow foundations as per IS: 1904-1978. 6M

UNIT-V

10. a) What are the different circumstances under which a pile foundation is used? 6M

    b) A friction pile 300mm in diameter is proposed to be driven in a layer of uniform cohesive soil. The pile tip is assumed to carry 20% of the load. The skin friction between the pile surface and the soil is assumed to be $50kN/m^2$. Determine the length of piling required to carry a safe load 200kN with a factor of safety of 4. 6M

(OR)

11. a) A pile group consisting of 9 piles is arranged in 3 rows with 3 piles in each row. Diameter of each pile is 45 cm and spacing is 1.2m. length of pile is 12m. The piles are driven completely in clayey soil having unconfined compressive strength of $90kN/m^2$. The piles are designed as frictional. Determine the capacity of pile group. Take $\alpha = 0.7$. 6M

    b) Discuss the settlement of pile groups resting in clays. 6M

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CODE: 13EE3018 SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, October-2021

POWER ELECTRONICS

(Electrical and Electronics Engineering)

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

PART-A

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

1. a) Define rise time.
   b) List any four applications of power electronics.
   c) What is the need of connecting SCRs in series or parallel?
   d) Write the essential condition to operate dual converter.
   e) Define line commutated inverter.
   f) Write any two operational differences between circulating and non-circulating mode operation of dual converter
   g) Why a PWM inverter is superior to a square wave inverter?
   h) List any four applications of inverters?
   i) Write the advantages in operation of choppers at high frequency.
   j) Discuss the time ratio control in a dc chopper.

PART-B

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

UNIT-I

2. a) Explain the construction IGBT. 6
   b) What is the need of connecting SCRs in series? Explain in detail the various issues & remedies during static and dynamic conditions on SCR. 6

(OR)

3. a) Explain the static V-I characteristics of SCR. 6
   b) Explain the operation of MOSFET. 6

UNIT-II

4. a) Explain the operation of single phase semi controlled converter for RL load operating with continuous current mode. Derive the expression for average load voltage and current 6
   b) A single phase full converter feeds power to RLE load with R = 6 Ω, L = 6 mH and E = 60V. The ac source voltage is 230V, 50Hz. For continuous conduction, find the average value of load current for a firing angle delay of 50^0. In case one of the four SCRs get open circuited due to a fault, find the new value of average load current taking the output current as continuous. Sketch waveform for the new output voltage and indicate the conduction of various SCRs. 6

(OR)

5. Explain the operation of single phase fully controlled convertor with R-Load. 12

UNIT-III

6. Analyze the performance of three phase fully controlled converter operating with RL load and sketch the output voltage and current waveforms for $\alpha=60^0$. Draw the waveforms of source line voltages, output load voltage and current. Also derive the average output voltage and current. 12

(OR)

7. Explain the operation of three phase fully controlled convertor with R-Load. 12

UNIT-IV

8. a) Explain the operation of single-phase cyclo-converter configuration. 6
   b) Explain the operation of AC voltage regulator for RL load. Derive the expression for RMS value of output voltage. 6

(OR)

9. a) A single phase half -wave ac voltage controller is connected with a load of R = 5 Ω with an input voltage of 230 V, 50 Hz. If the firing angle of thyristor is 45^0, determine: 6
      i) RMS output voltage ii) Power delivered to load
   b) Explain Integral cycle control for regulating output voltage of AC voltage regulator. 6

UNIT-V

10. a) Explain the operation of Boost regulator 8
    b) For the type A-chopper circuit, following conditions are given, Vs = 230V, load resistance is 10 ohm. Take a drop of 2V across chopper when it is on. For a duty cycle of 0.4, calculate 4
       i. average and RMS values value of output voltage and efficiency.
       ii. In case the pulse width is halved with constant frequency operation, find the new output voltage and current.

(OR)

11. a) Explain the principle of operation of chopper with necessary waveforms 6
    b) Explain various PWM methods. 6

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CODE: 13CS3024 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, October-2021

SOFTWARE PROJECT MANAGEMENT

(Computer Science & Engineering)

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

PART-A

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

1. a) What is software project Management?
   b) What are the activities covered by SPM?
   c) Define milestones.
   d) How to manage activity risks?
   e) What is RISK management?
   f) Mention the five levels of WBS
   g) What are the two factors used to progress of project?
   h) Expand the term RIO
   i) What is the use of SEPA?
   j) What are the Artifacts of software development?

PART-B

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

UNIT-I

2. a) Explain the evolution of waterfall model in detail. What are five necessary improvement for this model — 6M
   b) Explain about three generations of software development in detail. — 6M

(OR)

3. a) Explain Barry Boehm's Top 10 "Industrial Software Metrics". — 6M
   b) List out the parameters that influence software cost and explain in detail. — 6M

UNIT-II

4. a) What is a process? Explain the three levels of process and their attributes. — 6M
   b) What are the key practices that improve overall software quality? Explain in detail. — 6M

(OR)

5. a) How object-oriented technology permits corresponding improvements in teamwork and interpersonal communications. Give an Example. — 6M
   b) Discuss the important Principles of Conventional Software Engineering. — 6M

UNIT-III

6. a) Explain the evolution of the life-cycle of artifact sets in detail. — 6M
   b) Explore the different aspects of Architecture from management perspective. Explain — 6M

(OR)

7. a) Give an overview of the artifact sets that make the development of a complete software system manageable. — 6M
   b) Explain the check points of the process. — 6M

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UNIT-IV

8.	a)	Discuss in detail about the conventional work breakdown structure.	6M
	b)	What are the activities of software management team. Explain with organizational chart.	6M
		(OR)	
9.	a)	Explain about CASE Tool in process automation in different phases of lifecycle in unified model.	6M
	b)	Discuss in brief about Round-Trip Engineering and Software Change Order.	6M

UNIT-V

10.	a)	Explain about Seven Core Metrics used in managing modern software process.	6M
	b)	Explain about pragmatic software metrics. .	6M
		(OR)	
11.	a)	Explain about common sub systems of CCPDS-R project.	6M
	b)	Explain in detail about life cycle expectations in usage of seven core metrics.	6M

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