AR20

CODE: 20CET101 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Regular Examinations, October-2021

SURVEYING AND GEOMATICS

(Civil Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Explain the following terms (5M)
   (a) Representative fraction. (b) Scale of plan. (c) Graphical scale.
   b) Differentiate clearly between plane and geodetic surveying. (5M)

(OR)

2. a) Explain clearly the principle of chain surveying. (5M)
   b) What are the instruments used in chain surveying? How is a chain survey executed in the field? (5M)

UNIT-II

3. a) Give, in a tabular form, the difference between prismatic compass and surveyor's compass. (3M)
   b) Determine the values of included angles in the closed compass traverse ABCD conducted in the clockwise direction, given the following fore bearings of their respective lines. Apply the check. (7M)

line	F.B.
AB	40°
BC	70°
CD	210°
DA	280°

(OR)

4. a) What is local attraction? How is it detected and eliminated? (3M)
   b) Below are the bearings observed in a traverse survey conducted with a prismatic compass at a place where local attraction was suspected? (7M)

Line	Fore Bearing	Back Bearing
PQ	124° 30′	304° 30′
QR	68° 15′	246° 00′
RS	310° 30′	138° 15′
SP	200° 15′	17° 45′

At what stations do you suspect local attraction? Find the corrected bearings of the lines.

UNIT-III

5.	a)	What are the different types of levelling staff? State the merits and demerits.	(3M)
	b)	The following consecutive readings were taken with a level and 3 metre levelling staff on continuously sloping ground at a common interval of 20 metres: 0.602, 1.234. 1.860, 2574. 0.238, 0.914, 1.936. 2.872, 0.568, 1.824, 2.722. The reduced level of the first point was 192.122. Rule out a page of a level field book and enter the above readings. Calculate the reduced levels of the points and also check accuracy using any method.	(7M)

(OR)

6.	a)	Discuss various methods of interpolating the contours.	(5M)
	b)	Describe with the help of sketches the characteristics of contours.	(5M)

UNIT-IV

7.	a)	Discuss the principle of theodolite survey and principle of tachometry.	(5M)
	b)	What are 'face left' and 'face right' observations? Why is it necessary to take both face observations? Why both verniers are read?	(5M)

(OR)

8.	a)	Discuss the fundamentals of total station and GPS	(5M)
	b)	Explain the methods of setting out a simple curve.	(5M)

UNIT-V

9.	a)	Write down the advantages of photogrammetric surveying.	(5M)
	b)	Explain about terrestrial photogrammetry.	(5M)

(OR)

10.	a)	Discuss the perspective geometry of aerial photograph	(5M)
	b)	Write short on flight planning and Stereoscopy	(5M)

UNIT-VI

11.	a)	Write a short note on remote sensing data acquisition.	(5M)
	b)	Write a short note on Electromagnetic Spectrum.	(5M)

(OR)

12.	a)	Discuss the features used to identify satellite images through visual image interpretation?	(5M)
	b)	Explain about 5 components of GIS?	(5M)

AR20

CODE: 20HST101 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Regular Examinations, October-2021

ENGLISH

(Common to EEE & ECE Branches)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit.
All Questions Carry Equal Marks.
All parts of the Question must be answered at one place.

UNIT-I

1. a) Do you think Swami's father will have written anything against Samuel in the letter? Justify your answer from Father's Help. 5M

   b) Provide at least two synonyms for each of the following words. 5x1=5

   i. Authentic ii. Bewitching iii. Eccentric iv. Ferocious v. Fragile

(OR)

2. a) Who does Swami dislike more at this juncture - Samuel or Father? Why? 5M

   b) Write one-word substitutes for the following expressions. 5x1=5

   i. A person who presents a radio/television programme
   ii. One who supervises in the examination hall
   iii. A large natural or artificial lake used as a source of water supply
   iv. A person who introduces the performers or contestants in a variety show
   v. An artist who makes sculptures

UNIT-II

3. a) Give an account of the early influences of Abdul Kalam according to A P J Abdul Kalam's My Early Days? 5M

   b) Fill in the blanks with appropriate verb forms. 5x1=5

   i. I ----------(see) three movies so far this week.
   ii. How long ---------- you ----------(wait) for me?
   iii. Look! Those bees _____ (buzz) round the flowers.
   iv. He ----------(twist) his ankle while he was skiing.
   v. Lee ----------(be) late every day since Tuesday.

(OR)

4. a) What was the important lesson that Iyadurai Solomon taught Kalam? 5M

   b) Fill in the blanks with appropriate verb forms. 5x1=5

   i. I ---------- (see) a great film yesterday.
   ii. -------- you ---------- (buy) a new car?
   iii. I -------(meet) him last Monday.
   iv. The band ----------(play) while I was writing.
   v. Her mother ----------(live) in Victoria for the past five years.

UNIT-III

5. a) Does the speaker feel that he has made the wrong choice in taking the road "less travelled by"? If not, why does he "sigh"? What does he regret ? 5M

   b) b. Rewrite / Convert the following as directed. 5x1=5
   i. He said to the boy, "What are you doing here?" (into Indirect Speech)
   ii. He ordered the servant to get out of the room. (into Direct Speech)
   iii. Mohan is the strongest boy in the class. (into Positive Degree)
   iv. Though he is poor, he is honest.. (In spite of)
   v. He robbed the poor child as well as killed him. (Besides)

(OR)

6. a) What is the theme of the poem *The Road Not Taken*? 5M

   b) Rewrite / Convert the following as directed. 5x1=5
   i. The Principal said, "There will be a holiday tomorrow." (into Indirect Speech)
   ii. The poor woman desperately begged them to save her. (into Direct Speech)
   iii. Buddha is wiser than Solomon (into Postive Degree)
   iv. Immediately after hearing the news, he wrote to me. (As soon as)
   v. Owing to his illness, he could not go to school. (as)

UNIT-IV

7. a) What are the three expressions that the author wishes would stop being used and what are their meanings? 5M

   b) Punctuate the below extract. 5M
   this must be where she lost my present and was looking for it sludge sniffed the snow i looked in the snow for a package or the snow print of a package but the snow next to the sled marks was unbroken i nate the great was puzzled how could something drop off the sled and not be in the snow or leave a mark in the snow there were no footprints either so i nate the great knew that no one had come along and taken the birthday present but how did the present get off the sled and where was it i said that this is a tough ice-cold case sludge shivered we trudged on we saw annie and her dog fang sludge shivered some more he was afraid of fang i nate the great was afraid of fang fang ran toward us sludge leaped over a big pile of snow i had never seen sludge leap that high annie said fang is so friendly she was making a snow dog it looked just like fang it had icicles for teeth

(OR)

8. a) What do you think about the rules the author has given to make usage of English better? Does it help in making language simpler and easier to understand? 5M

b) Fill in the blanks of the below passage with appropriate prepositions. 5x1=5

Plato is the earliest important educational thinker, and education is an essential element__(i)__ "The Republic" (his most important work on philosophy and political theory, written around 360 B.C.). In it, he advocates some rather extreme methods: removing children __(ii)__ their mothers' care and raising them as wards of the state, and differentiating children suitable to the various castes, the highest receiving the most education, so that they could act as guardians of the city and care __(iii)__ the less able. He believed that education should be holistic, including facts, skills, physical discipline, music and art. Plato believed that talent and intelligence is not distributed genetically and thus is be found in children born __(iv)__ all classes, although his proposed system of selective public education __(v)__ an educated minority of the population does not really follow a democratic model.

UNIT-V

9. a) If you were to write about the issues discussed in *Mother's Day* today, what are some of the incidents, examples and problems that you would think of as relevant? 5M

   b) Write a letter to your principal about conducting a *Tech Fest* in your college. 5M

(OR)

10. a) What are the issues raised in *Mother's Day* and how can they be resolved? 5M

    b) Write an e-mail to your colleague thanking him for the help you received recently. 5M

UNIT-VI

11. a) Write a brief note on the origin of the Chipko Movement. 5M

    b) Read the following passage carefully and answer questions given below. 5x1=5

The New School

Tracey is starting a new school today. She is very sad. She is very scared. "I don't want to go to school today," Tracey tells her dad. "I understand, sweetheart," Dad says. "Starting a new school can be very scary." Tracey has moved to a new town. She has moved to a new house. She is starting a new school today. She has done all of this in a week! "I feel sick," Tracey says. "My stomach hurts. I can't eat breakfast." "I think that is because you are nervous," Dad says. He pats Tracey's hair. He gives her a little hug. "Try drinking just a little juice. Then I will walk you to school." Tracey and her dad walk to school. Tracey thinks about many things. Will I make friends? Will I like my teacher? What if I don't know the answer to a question? Will kids laugh at me? What if no one likes me? "We're here," says Dad.

Tracey looks up at the big building. Her other school was small. Tracey wishes she could run away. She knows she cannot. She takes a deep breath. She walks up the steps to school. She walks into her third grade classroom. “That must be Tracey,” she hears a boy say. “Hello, Tracey!” “Welcome, Tracey!” “Let me show you around.” Everyone seems kind. Tracey feels a little better. Bu she is still not happy. She is still a little scared. She cannot eat her lunch. Dad picks Tracey up after school. “How was your day?” he asks. “Okay,” she says. “It will get better,” Dad says. “Big changes are hard.” “I know,” says Tracey. She reaches for her dad’s hand to hold as they walk home.

1) Why is Tracey sad and scared?
   A. She is moving to a new house today.
   B. She is moving to a new town today.
   C. She is starting a new school today.
   D. She is walking to school alone today.

2) What has Tracey done during the week?
   I. made a new friend
   II. moved to a new town
   III. moved to a new house
   A. I only B. I and II C. II and III D. I, II, and III

3) What grade is Tracey in?
   A. second grade
   B. third grade
   C. fourth grade
   D. fifth grade

4) Why can't Tracey eat breakfast?
   I. She is nervous. II. Her stomach hurts. III. She is late for school.
   A. I only B. I and II C. II and III D. I, II, and III

5) Why does Tracey's dad think she feels sick?
   A. because she is sleepy
   B. because she is nervous
   C. because she has a cold
   D. because she ate too much

(OR)

12. a) What do you understand by environmental movements? What positive changes do they bring in the social realm? 5M

    b) Write an essay on “Present Education System during COVID-19” in 500 words. 5M

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CODE: 20MET101 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Regular Examinations, October-2021

THERMODYNAMICS

(Mechanical Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

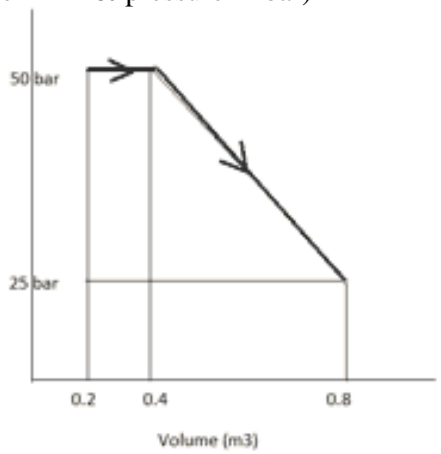
All parts of the Question must be answered at one place

Steam Tables are allowed

UNIT-I

1. a) What is the difference between the macroscopic and microscopic forms of energy? 4M

   b) Determine the total work done by a gas system following an expansion process as shown in Figure.(volume in m^3 & pressure in bar) 6M



(OR)

2. a) State Zeroth law of Thermodynamics and give it's significance? 4M

   b) A gas in a piston cylinder assembly undergoes an expansion process for which the relationship between pressure and volume is given by PV^n=constant. The initial pressure is 0.3MPa, the initial volume is $0.1m^3$, final volume is $0.2m^3$. Determine the work for the process in kJ, if a)n=1.5, b) n=0,c)n=1 6M

UNIT-II

3. a) What is first law of thermodynamics? Write two different forms of first law of thermodynamics 4M

   b) A gas within a piston–cylinder assembly undergoes a thermodynamic cycle consisting of three processes: 6M

   Process 1–2: Constant volume, V = 0.028 m3, $U_2 - U_1$ =26.4 kJ.

   Process 2–3: Expansion with pV = constant, $U_3 = U_2$.

   Process 3–1: Constant pressure, p = 1.4 bar, W_{3-1} = -10.5 kJ.

   There are no significant changes in kinetic or potential energy.

   (i) Sketch the cycle on a p–V diagram.

   (ii) Calculate the net work for the cycle, in kJ.

   (iii) Calculate the heat transfer for process 2–3, in kJ.

   (iv) Calculate the heat transfer for process 3–1, in kJ.

(OR)

4. a) Derive the steady state flow energy equation. 4M

   b) Air at 10°C and 80 kPa enters the diffuser of a jet engine steadily with a velocity of 200 m/s. The inlet area of the diffuser is 0.4 m^2. The air leaves the diffuser with a velocity that is very small compared with the inlet velocity. Determine (a) the mass flow rate of the air and (b) the enthalpy of the air leaving the diffuser. Given enthalpy of air at 283 K = 283.14 kJ/kg. 6M

UNIT-III

5. a) State the difference in the working of a refrigerator and a heat pump 4M

   b) A household refrigerator is maintained at a temperature of 3°C. Every time the door is opened, warm material is placed inside, introducing an average of 500 kJ, but making only a small change in the temperature of the refrigerator. The door is opened 20 times a day, and the refrigerator operates at 20% of the ideal COP. The cost of work is Rs 3 per kWh. What is the monthly bill for this refrigerator? The atmosphere is at 30°C. 6M

(OR)

6. a) State and prove corollary of Carnot's theorem 4M

   b) A refrigeration cycle has a coefficient of performance equal to 75% of the value for a reversible refrigeration cycle operating between cold and hot reservoirs at -5^0C and 40^0C, respectively. For operation at steady state, determine the net power input, in kW per kW of cooling, required by 6M
   (i) the actual refrigeration cycle and
   (ii) the reversible refrigeration cycle. Compare values.

UNIT-IV

7. a) Give the exergy balance of a steady flow system 4M

   b) An isolated system consists of two solid blocks. One block has a mass of 5kg and is initially at 300^0C. The other block has a mass of 10 kg and is initially at -50^0C. The blocks are allowed to come into thermal equilibrium. Assuming the blocks to be incompressible with constant specific heats of 1.0 and 0.4kJ/kg K respectively, determine the final temperature and the irreversibility. Take ambient temperature as 27^0C. 6M

(OR)

8. a) Why is exergy of a fluid at a higher temperature more than that at a lower temperature 4M

   b) In a rotary compressor, air enters at 1.1 bar and 21^0C where it is compressed adiabatically to 6.6 bar, 250^0C. Calculate the irreversibility and the entropy production for unit mass flow rate. The atmosphere is at 1.03 bar, 20^0C. Neglect K.E changes. 6M

UNIT-V

9. a) What is a pure substance and what do you understand by saturation states 4M

   b) 10 kg of water at 45^0C is heated at a constant pressure of 10 bar until it becomes superheated vapour at 300^0C. find the change in volume, enthalpy, internal energy and entropy. 6M

(OR)

10. a) What is Avagadro's law and write equation of state of an ideal gas 4M

    b) Derive first and second TdS equations 6M

UNIT-VI

11. a) Derive the expression of mean effective pressure of Diesel-cycle. 4M

    b) An engine operating on air-standrad Diesel cycle sucks in air at 1 bar and 300 K and compresses it to 40 bar before fuel injection. If the energy added (per cycle) as heat is 600 kJ/kg air, calculate (i) compression ratio (ii) cut-off ration (iii) thermal efficiency (iv) work done per kg. Take Cp of air = 1.0045 kJ/kgK 6M

(OR)

12. a) Show that efficiency of the Otto cycle depends only on compression ratio. 4M

    b) An air-standard dual cycle has a compression ratio of 9. At the beginning of compression, p_1 = 100 kPa, T_1 = 300 K, and V_1 = 14 L. The heat addition is 22.7 kJ, with one half added at constant volume and one half added at constant pressure. Determine 6M
    (i) the temperatures at the end of each heat addition process, in K.
    (ii) the net work of the cycle per unit mass of air, in kJ/kg.
    (iii) the thermal efficiency.

AR20

CODE: 20CST101 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Regular Examinations, October-2021

DATA STRUCTURES AND ALGORITHMS

(Common to CSE & IT)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Define Data structure. List different operations performed on Data Structures.	3 M
	b)	Inspect, why we need an Asymptotic notation. Explain the different Asymptotic notations with definition and example.	7 M
		(OR)	
2.		Define Algorithm .Explain the differences between Recursive & non recursive algorithms with example programs .	10 M

UNIT-II

3.	a)	List out the differences between Linear Search & Binary Search	5 M
	b)	Write the algorithm for quick sort and calculate its time complexity.	5 M
		(OR)	
4.	a)	Explain the reason for Occurring Collision. Explain any ONE method to resolve the Collision.	5 M
	b)	Write the algorithm for Insertion sort and calculate its time complexity	5 M

UNIT-III

5.		Demonstrate the following Deletion operations on single linked list with example . a) At the beginning of the list b) at the end of the list c) at any given position	10 M
		(OR)	
6.	a)	Explain the difference between Single linked list & Double linked list .	3 M
	b)	Demonstrate the following Insertion operations on Circular linked list with example . a) At the beginning of the list b) at any given position	7 M

UNIT-IV

7.		Write a menu driven program for stack implementation using array for a) PUSH b) POP and c) Display operations	10 M
		(OR)	
8.	a)	Explain the procedure to Convert the below Infix expression into Postfix & Prefix using Stack. **(A+B)*[(C-D)/(E*F)]**	6 M
	b)	Write an algorithm for insertion & deletion operations in Circular Queue.	4 M

UNIT-V

9.	a)	Explain the different Binary Tree Traversal Techniques.	5 M
	b)	Construct the Binary Search Tree in step by step for the below given nodes . 10, 14, 16, 8,17, 6, 23, 60 , 5 , 18, 27, 36, 12, 87, 65 , 50 .	5 M
		(OR)	
10.		Explain the operations in B-Tree with an example .	10 M

UNIT-VI

11.		Write the algorithms for BFS and DFS.	10 M
		(OR)	
12.		Explain in brief how shortest path is calculated using Dijkstra's algorithm with an example.	10 M