AR18

CODE: 18CET206 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B. Tech II Semester Regular Examinations, November-2020

ENGINEERING GEOLOGY

(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 importance of geology in civil engineering point of view.	6M
	b)	Write the physical properties of Hornblene and biotite mica.	6M
		(OR)	
2.	a)	Define weathering. Explain the terms (i) disintegration (ii) decomposition (iii) denudation.	6M
	b)	Write the physical properties of Chalcedony and Feldspar.	6M

UNIT-II

3.	a)	Describe the structures of Igneous rocks	6M
	b)	Write about the properties and uses of i) Dolerite ii) Gneiss	6M
		(OR)	
4.	a)	What is metamorphism? Explain different types of metamorphism.	6M
	b)	Describe suitability of Sedimentary Rocks for Civil Engineering purposes.	6M

UNIT-III

5.	a)	Define the term “Fault”. Describe various types of faults	6M
	b)	Explain the following: i) Angular unconformity ii) recumbent fold	6M
		(OR)	
6.	a)	Explain different types of joints.	6M
	b)	Write short note on strike and dip of a bed?	6M

UNIT-IV

7.		Describe the geological controls of groundwater.	12M
		(OR)	
8.	a)	Give a brief account of measures commonly adopted for landslides.	6M
	b)	Explain (a) Focus (b) Epicenter and (c) tectonic earthquakes.	6M

UNIT-V

9.	a)	What are causes and effects of tunnelling?	6M
	b)	Explain the importance of geophysical studies.	6M
		(OR)	
10.		Summarize the geological considerations in the selection of dam site.	12M

***

AR18

CODE: 18BST209 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, November-2020

BIOLOGY

(Common to EEE & ME)

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 main fundamental differences between Science and Engineering?	6M
	b)	Analyse the biological observations of 18th century lead to major discoveries in the contemporary world?	6M
		(OR)	
2.	a)	What are the most exciting things about biology?	6M
	b)	Discuss why we need to study biology?	6M

UNIT-II

3.	a)	Classify the micro organisms based on Energy and carbon utilization?	6M
	b)	Demonstrate the concept of species ad strains?	6M
		(OR)	
4.	a)	Contrast the differences between aquatic and terrestrial animals with suitable examples?	6M
	b)	Summarize the ecological aspects of single celled organisms?	6M

UNIT-III

5.	a)	Define monohybrid cross? Demonstrate the mendal's laws of Dominance and Segregation?	6M
	b)	what is Epistasis? Explain with suitable example?	6M
		(OR)	
6.	a)	Discuss about the single gene disorders in humans?	6M
	b)	Explain the double helix structure of DNA?	6M

UNIT-IV

7.	a)	Discuss the Mechanism of Enzyme action?	6M
	b)	Summarize the functions of proteins?	6M
		(OR)	
8.	a)	Write the general properties of Enzymes?	6M
	b)	Explain the Hierarchy in protein structure?	6M

UNIT-V

9.	a)	Discuss the thermo dynamics of Biological systems with suitable examples?	6M
	b)	Explain the differences between Energy consuming and Energy yielding reactions?	6M
		(OR)	
10.	a)	Discuss the concepts of Exothermic and Endothermic reactions?	6M
	b)	Define Photosynthesis and explain the synthesis of glucose from Co2 and H2o?	6M

***

AR18

CODE: 18ECT207 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, November-2020

ELECTRO MAGNETIC WAVES & TRANSMISSION LINES

(Electronics and Communication 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)	How do you find Electric field intensity using Gauss's law? Explain with example.	6M
	b)	Derive the expression for electric field intensity due to infinite line charge.	6M

(OR)

2.	a)	Explain the following. i). continuity equation for current. ii). relaxation time	6M
	b)	A total charge of 40/3 nC is uniformly distributed in the form of a circular disk of radius 2 m. Find the potential due to this charge at a point on the axis, 2 m from the disk.	6M

UNIT-II

3.	a)	State and explain Ampere′s circuital law for steady currents.	6M
	b)	Derive the Maxwell equations for electro statics	6M

(OR)

4.	a)	State and explain the Biot-Savart law and derive the expressions for magnetic field intensity due to surface currents.	6M
	b)	Explain about the forces due to Magnetic Fields.	6M

UNIT-III

5.		Derive the boundary conditions for the tangential and normal components of magneto static fields at the boundary between two perfect dielectrics.	12M

(OR)

6.	a)	Explain the Maxwell's equations for static fields and time varying fields.	6M
	b)	Describe the Inconsistency of Ampere's Law and displacement current density.	6M

UNIT-IV

7.	a)	Explain the terms linear polarization and circular polarization in wave propagation.	4M
	b)	Explain Poynting theorem.	8M

(OR)

8.	a)	Explain wave propagation in lossy medium (Conducting medium).	6M
	b)	When the amplitude of the magnetic field in a plane wave is 2A/m, a) determine the magnitude of electric field in free space b) determine the magnitude of electric field when the plane wave propagating in a medium which is characterised by $\sigma=0$, $\mu=\mu_0$, $\varepsilon=4\varepsilon_0$.	6M

UNIT-V

9.	a)	Derive the input impedance of a transmission line.	6M
	b)	Discuss about phase velocity, group velocity and reflection coefficient and VSWR.	6M

(OR)

10.	a)	Discuss the stub matching techniques of impedance matching.	6M
	b)	Determine the primary constants, R, L, G, and C for a distortion-less line working at 300MHz. Given that the line has characteristic impedance, Z_o =75Ω, attenuation constant, α=0.12Np/m, and wave velocity, $v=1.4\times10^8$m/s.	6M

***

AR18

CODE: 18BST205 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, November- 2020

PROBABILITY AND STATISTICS WITH R

(Common to CSE AND 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) A random variable x has the following probability function: 6

x	0	1	2	3	4	5	6	7
P(x)	0	k	2k	2k	3k	K^2	$2K^2$	$7K^2+k$

Compute *(i) E* (x) *(ii) V* (X).

b) Derive mean and variance of Poisson distribution. 6

(OR)

2. a) Given the following table 6

X	-3	-2	-1	0	1	2	3
P(x)	0.05	0.15	0.30	0	0.30	0.15	0.05

Compute *(i) E* (x) , *(ii).E(2X+3) (iii) V* (X)

b) Two dice are thrown. Let X assign to each point (a, b) in S the maximum of its numbers i.e., X(a, b) = max(a, b). Find the probability distribution. X is a random variable with X(s) = {1,2,3,4,5,6}. Also find the mean and variance of the distribution. 6

UNIT-II

3. a) Let X be a continuous variate with p.d.f. f(x)= $\begin{cases} 12x^3+21x^2+10x \\ 0 \end{cases}$; *0≤x≤1,* find 6
i) p(x≤1/2) and p(x>1/2); ii) determine a number k such that p(x≤k)=1/2.

b) The time required to assemble a piece of machinery is a random variable having approximately a normal distribution with μ = 12.9 minutes and σ = 2.0 minutes. What are the probabilities that the assembly of a piece of machinery of this kind will take (i) at least 11.5 minutes; (ii) anywhere from 11.0 to 14.8 minutes. 6

(OR)

4. a) A random variable X has the density function: 6

$$f(x) = K.(1-x^2) \text{ for } 0<x<1$$

$$=0 \text{ otherwise.}$$

Find the value of *K* and that probability that random variable will take on a value i) between 0.1 and 0.2; ii) greater than 0.5.

b) In a distribution of normal, 7% of items are under 35 and 89% are under 63. What are the mean and standard deviation of the distribution? 6

UNIT-III

5. Construct sampling distribution of means for the population 2, 5, 9, 11 by drawing sample of size two with replacement. Determine (i) population mean (ii) population variance (iii) the mean of sampling distribution of means (iv) standard error 12

(OR)

6. a) A random sample of 100 teachers in a large metropolitan area revealed a mean weekly salary of Rs. 487 with a standard deviation Rs.48. With what degree of confidence can we assert that the average weekly salary of all teachers in the metropolitan area is 502? 6

b) A company claims that its light bulbs are superior to those of its main competitor. If a study showed that a sample of n1=40 of its bulbs has a mean lifetime of 1470 hours of continuous use with a standard deviation of 27 hours, while a sample of n2=40 bulbs made by its main competitor had a mean lifetime of 1503 hours of continuous use with a standard deviation of 31 hours, does this substantiate the claim at the 0.05 level of significance? 6

UNIT-IV

7. a) Ten specimens of copper wires drawn from a large lot have the following breaking strength: 578, 572, 570, 568, 572, 571, 570, 572, 596, and 548. Test whether the mean breaking strength of the lot may be taken be 578kg. Assume 0.05 level? 6

b) Two sales men A and B are working in a certain district. From a sample survey conducted by head office, the following results were obtained. State whether there is any significant difference in the average sales between two sales men. 6

No of sales	20	18
Average sales (in Rs.)	170	205
Standard deviation (in Rs)	20	25

(OR)

8. Mechanical engineers, testing a new arc welding technique, classified welds both with respect to appearance and an x-ray inspection. 12

x-ray	Appearance			
	bad	Appearance normal	good	total
Bad	20	7	3	30
Normal	13	51	16	80
Good	7	12	21	40
Total	40	70	40	150

Test for independence using $\alpha = 0.05$ and find the individual cell contributions to the chi-square test statistics.

UNIT-V

9. a) For 10 randomly selected observations, the following data were obtained. Fit y on x regression line. 6

Over time hours (x)	1	1	2	2	3	3	4	5	6	7
Additional hours (y)	2	7	7	10	8	12	10	14	11	14

b) Determine the constants a and b by the method of least squares such that $y = a.e^{bx.}$ 6

x	2	4	6	8	10	12
y	4.077	11.084	30.128	81.897	222.629	441.987

(OR)

10. a) Calculate the coefficient of correlation for the ages of husbands and wives. 6

Age of husband (in years)	23	27	28	29	30	31	33	35	36	39
Age of Wife (in years)	18	22	23	24	25	26	28	29	30	32

b) The following table provides data about the percentage of students who have free university meals (x) and their CGPA scores (y). Calculate the Spearman's Rank Correlation between the two. 6

State University	Pune	Chennai	Delhi	Kanpur	Ahmadabad	Indoor	Guwahati
x	14.4	7.2	27.5	33.8	38.0	15.9	4.9
y	54	64	44	32	37	68	62

***