AR18

CODE: 18CET206 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February, 2021

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 about weathering of rocks.	6M
	b)	Classify the methods of study of minerals?	6M
		(OR)	
2.	a)	What are the main and allied branches of geology?	6M
	b)	What is the significance of different physical properties in mineral identification?	6M

UNIT-II

3.	a)	Briefly discuss the classification of rocks.	6M
	b)	Explain about the rock cycle?	6M
		(OR)	
4.	a)	Identify the importance of Petrology in Civil Engineering?	6M
	b)	Summarize the organically formed rocks (Organic deposits)?	6M

UNIT-III

5.	a)	Categorize the causes for development of structures?	6M
	b)	Categorize the joints in igneous, sedimentary and metamorphic rocks?	6M
		(OR)	
6.	a)	What are the effects of faulting and their civil engineering importance?	6M
	b)	Illustrate the common faults types in the major tectonic activities?	6M

UNIT-IV

7.	a)	Explain the magnitude of earth quake?	6M
	b)	Explain the fluctuation of the water table level in unconfined aquifers.	6M
		(OR)	
8.	a)	Explain about plate tectonics and earthquake distribution.	6M
	b)	What are the effects of landslides and preventive measures for it?	6M

UNIT-V

9.	a)	What is the necessity of geological investigations?	6M
	b)	Explain the economic aspects of Reservoir?	6M
		(OR)	
10.	a)	Explain about the electrical resistivity method.	6M
	b)	Identify the effects of Joints at Tunnel site?	6M

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AR18

CODE: 18BST209 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February, 2021

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)	Discuss major investigations of biology that lead to development of engineering	6M
	b)	Enumerate fundamental differences between Science and Engineering with live examples	6M
		(OR)	
2.	a)	What are the cotemporary aspects of biology as an independent scientific discipline	6M
	b)	Explain physical properties of Cytoplasm with reference to Brownian movement	6M

UNIT-II

3.	a)	Identify aminotelic, uricotelic and ureotelic organisms based on their excretion	6M
	b)	Identify auto tropes, hetero tropes and litho tropes based on their carbon utilisation	6M
		(OR)	
4.	a)	Contrast the difference between prokaryotes and eukaryotes	6M
	b)	Summarize the main constituents in culture media and their functions	6M

UNIT-III

5.	a)	Derive Mendel's laws of inheritance	6M
	b)	Discuss single gene disorders with suitable example in human	6M
		(OR)	
6.	a)	Differentiate the structure and functions of DNA and RNA	6M
	b)	Explain the Concept of genetic code in Eukaryotes	6M

UNIT-IV

7.	a)	Write physical and chemical properties of Enzymes	6M
	b)	Discuss the Enzyme kinetics and its parameters	6M
		(OR)	
8.	a)	Explain the Mechanism of enzyme action with suitable examples	6M
	b)	Describe the structure and functions of Proteins	6M

UNIT-V

9.	a)	Mention laws of Thermodynamics and apply to biological systems	6M
	b)	Write the process of break down on glucose molecule into pyruvic Acid	6M
		(OR)	
10.	a)	Describe cyclic and non-cyclic photo phoshorylation	6M
	b)	Explain the sequence of biochemical reactions in Krebs cycle	6M

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AR18

CODE: 18ECT207 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February, 2021

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)	State and explain the Coulomb′s law of force and the terms point charge, source point and field point.	6M
	b)	Find Electric filed intensity at (0, 0, 5)m due to $Q_1 = 0.35\ \mu$C at (0, 4, 0) m and $Q_2 = -0.55\ \mu$C at (3, 0, 0) m.	6M
		(OR)	
2.	a)	State and explain the Gauss′ law of electro statics.	6M
	b)	Explain about Poissons and Laplaces equations.	6M

UNIT-II

3.	a)	State and prove Biot-Savarts law.	6M
	b)	Derive the Maxwell‘s two equations for Magneto static Fields.	6M
		(OR)	
4.	a)	State and explain Ampere’s force law for current elements and loops.	6M
	b)	If magnetic field intensity B=1.0$\mathbf{a}_x$+3.0$\mathbf{a}_y$ Wb/m2 a current filament 10$\mathbf{a}_z$ mA-m is placed. Find the force on this current element.	6M

UNIT-III

5.	a)	What is inconsistency of Ampere’s law? Explain with example.	6M
	b)	Given E= $E_m \sin(\omega t-\beta z)\ a_y$ in free space, find **D,B** and **H**. Sketch E and H at t=0.	6M
		(OR)	
6.	a)	Derive the boundary conditions for dielectric-dielectric interface.	6M
	b)	Write down Maxwell’s equations in their general differential form and integral form.	6M

UNIT-IV

7.	a)	Explain wave propagation in lossless medium.	6M
	b)	State and prove Poynting theorem.	6M
		(OR)	
8.	a)	Explain reflection of waves at normal incidence on perfect conductor.	8M
	b)	The Brewster angle for a parallel-polarized wave travelling from air into glass for which $\epsilon_r = 5.0$	4M

UNIT-V

9.	a)	Explain about the Primary & Secondary Constants of transmission lines	6M
	b)	A transmission line used to connect a transmitter to its antenna has a characteristic impedance $Z_0 = 50\ \Omega$. The antenna with impedance Z_L= (100+j75) Ω is connected as a load. Calculate load reflection coefficient.	6M
		(OR)	
10.	a)	Show that the input impedance of transmission line terminated with Characteristic impedance is equal to characteristic impedance.	6M
	b)	A lossless transmission line of length 0.5λ and Z0= 50Ω is terminated in an impedance 100+j80Ω. Find i) VSWR ii) Input impedance	6M

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AR18

CODE: 18BST205 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February, 2021

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) Find the value of k, mean and variance for the following discrete distribution. 6

x	-3	-2	-1	0	1	2	3
p(x)	k	0.1	k	0.2	2k	0.4	2k

b) Ten coins are thrown simultaneously. Find the probability of getting at least 6
i) seven heads ii) Six heads

(OR)

2. 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	$2k^2$	$7k^2+k$

Determine i) k, ii) find p(x=6) and iii) p(0<x<5)

b) If a random variable has a Poisson distribution such that p(x=1) = p(x=2), find 6
i) Mean of the distribution ii) p(x≥1)

UNIT-II

3. a) Let $f(x) = 3x^2$, when $0 \le x \le 1$ be the probability density function of a continuous variable X. Determine 'a' and 'b' such that (i) p(x≤a) = p(x>a); (ii) p(x>b) = 0.5. 6

b) A sales tax officer has reported the average sales of the 500 business that he has to deal with during a year is Rs.36,000 with a standard deviation of Rs. 10,000. Assuming that the sales in this business are normally distributed, find i) the number of business as the sales of which are more than Rs. 40,000, ii) the percentage of business the sales of which are likely to range between Rs. 30,000 to Rs. 38,000. 6

(OR)

4. a) For the continuous random variable x whose probability density function is given by 6

$$f(x) = \begin{cases} cx(2-x); if\ 0 \le x \le 2 \\ 0; otherwise \end{cases}$$

Find c, mean and variance of x.

b) In a normal distribution 31% of the items are under 45 and 8% are over 64. Find the mean and variance of the distribution. 6

UNIT-III

5. A population consists of five numbers: 8, 5, 9, 6. Consider all possible distinct samples of size 2 without replacement. Find i) Population mean ii) Population Standard Deviation iii) Mean of sampling distribution of means and iv) Standard Error. 12

(OR)

6. a) An average commission charged by a service brokerage firm on a sales of stock is Rs.154 and S.D is Rs.52. we take a random sample of 12 traders by his clients and determine that they paid average commission of Rs.161. can you conclude that clients average commission are higher than industry average? Use 5% level of significance 6

b) An investigation of two kinds of photocopying equipment showed that 71 failures of the first kind of equipment took on the average 83.2 minutes to repair with a standard deviation of 19.3 minutes, while 75 failures of the second kind of equipment took on the average 90.8 minutes to repair with a standard deviation of 21.4 minutes. Test the null hypothesis $\mu_1 - \mu_2 = 0$ (the hypothesis that on the average it takes an equal amount of time o repair either kind of equipment) against the alternative hypothesis $\mu_1 - \mu_2 \neq 0$ at the level of significance of $\alpha = 0.05$ 6

UNIT-IV

7. a) 9 workers are selected at random from a large number of workers in a factory. The number of items produced by them on a certain day is found to be: 51, 52, 53, 55, 56, 57, 58, 59, 60. In the light theses data, would it be appropriate to suggest the mean of the number of items produced in the population is 58? 6

b) In a test given to two groups of students, the marks obtained out of 50 are as follows: 6

First Group	18	20	36	49	41	38
Second Group	29	35	30	44	46	42

Examine the significance of difference between the means of the marks secured by the students of two groups

(OR)

8. A movie producer is bringing out a new movie. In order to map out a advertising campaign, he wants to determine whether the movie will appear most to a particular age group or whether it will appeal equally to all age groups. The producer takes a random sample from persons attending preview of the new movie and obtain the following results. 12

Choice	Age Group			
	Under 20	20-39	40-59	60 and above
Liked the movie	146	78	48	28
Disliked the movie	54	22	42	22
Indifferent	20	10	10	20

What inference will you draw from this using chi-square test for independence of attributes?

UNIT-V

9. a) The table below shows data from the early days of the Italian clothing company Benetton. Each row in the table shows Benetton's sales (y) for a year and the amount spent on advertising that year (x). Fit y on x regression line. 6

Sales in million Euro	27	30	32	36	39	40	43
Advt Exp in million Euro	5	7	8	11	13	14	16

b) Obtain a relation of the form $y = a.b^x$ for the following data by the method of least squares. 6

x	2	3	4	5	6	7
y	8.3	15.4	33.1	65.2	127.4	167.4

(OR)

10. a) On an experimental basis, he complied data on the length of service and respective yearly wages (in Rs. '000) of a group of 10 randomly selected workers. Determine the strength of association between then by correlation coefficient. 6

Length of Service (in years)	11	7	9	5	8	6	10	12	3	4
Yearly wages (in '000)	14	11	10	9	13	10	14	16	6	7

b) The raw data in the table below is used to calculate the correlation between the IQ of a person with the number of hours spent in front of TV per week. Calculate the Spearman's Rank Correlation between the two. 6

IQ	106	86	100	101	99	103	97	113	112	110
Hours of TV per Week	7	0	27	50	28	29	20	12	6	17

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