AR18

CODE: 18CET204   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary 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 objectives and principles of Surveying. (6M)
  (b) Explain the functions of the various component parts of Chain, (6M)
      Prismatic Compass with sketch.
                                    (OR)
2 (a) Explain about the functional classification of surveying (4M)
  (b) A closed traverse ABCDE was run and the observed bearings of lines (8M)
      were obtained as under. Correct the bearings for local attraction?

Line	Fore Bearing	Back Baring
AB	$72°45^1$	$252°0^1$
BC	$349°0^1$	$167°15^1$
CD	$298°30^1$	$118°30^1$
DE	$229°0^1$	$48°0^1$
EA	$135°30^1$	$135°0^1$

UNIT-II

3 (a) Explain the temporary adjustments made in a dumpy level (4M)
  (b) The following consecutive readings were taken with a dumpy level, the (8M)
      instrument having been moved after the 4th, 8th, 11th readings:
      1.115,0.745, 1.245, 1.065, 0.785, 1.315, 2.150, 0.845, 1.150, -2.365,
      1.360, 1.575, 1.840. The first reading was taken with the staff held upon
      a benchmark of elevation 325.675. Tabulate the page of field book and
      Calculate the levels of the points using any method.

                                    (OR)
4 (a) Describe about contour interval and uses of contours. (6M)
  (b) Discuss the difference in procedure of measuring horizontal angle with (6M)
      a Theodolite, Tacheometry

UNIT-III

5 (a) Explain in detail about various equipment used for theodolite survey   (6M)
   (b) Discuss the difference in procedure of measuring horizontal angle with   (6M)
        Tacheometry and Theodolite

(OR)

6 (a) Describe in detail about methods of tachometric surveying   (6M)
   (b) Explain the various types of curves and components in setting   (6M)
        out curves

UNIT-IV

7 (a) Discuss the stereoscopy in photogrammetry? How does a stereoscope   (6M)
        work?
   (b) Explain briefly about relief and tilt displacements?   (6M)

(OR)

8 (a) Define about photogrammetric surveying?   (6M)
   (b) Explain about terrestrial photogrammetric surveying and flight   (6M)
        planning?

UNIT-V

9 (a) Discuss about electromagnetic spectrum with neat sketches.   (6M)
   (b) Explain the applications of GIS in surveying   (6M)

(OR)

10 (a) Discuss the process of remote sensing data acquisition systems?   (6M)
    (b) Explain briefly about visual image interpretation   (6M)

CODE: 18EET205   **SET-1**

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

ELECTRONIC DEVICES AND CIRCUITS
(Electrical and Electronics 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) Draw and explain VI Characteristics of PN Junction diode. Write current equation of PN Junction   6M
   b) Explain the construction and working of Zener diode.   6M

(OR)

2. a) Explain the construction and working of LED.   6M
   b) Explain the working of PN diode in forward and reverse bias conditions.   6M

UNIT-II

3. a) With a neat diagram and explain working principle of full wave rectifier.   6M
   b) List the types of filters used in rectification & compare various filter circuits in terms of ripple factors.   6M

(OR)

4. a) Draw the Full-wave rectifier with center-tapped transformer and derive expression for its efficiency and ripple factor.   6M
   b) An a.c. supply of 230V is applied to a half-wave rectifier circuit through transformer of turns ration 5:1. Assume the diode is an ideal one. The load resistance is 300Ω. Find (i) dc output voltage (ii) PIV (iii) maximum value of load current (iv) average value of load current and (v)power delivered to the load.   6M

UNIT-III

5. a) Draw the input & output characteristics of an NPN transistors in CB configuration & explain.   6M
   b) A transistor has $I_B=100\ \mu A$ and $I_C=2$ mA. Find i) β ii) α iii) I_E iv) if I_B changes by $+25\ \mu A$ and I_C changes by +0.6 mA, find the new value of β.   6M

(OR)

6. a) Draw the input & output characteristics of an NPN transistors in CE configuration & explain.   8M
   b) Derive an expression between transistor parameters (α, β, γ)?   4M

UNIT-IV

7. a) What is the use of biasing? Explain how to draw load line.   6M
   b) Design the circuit shown, given Q-point values are I_{CQ} = 1 mA and V_{CEQ} = 6   6M
   V. Assume that V_{CC} = 10 V, β = 100 and $V_{BE(on)}$ = 0.7 V.
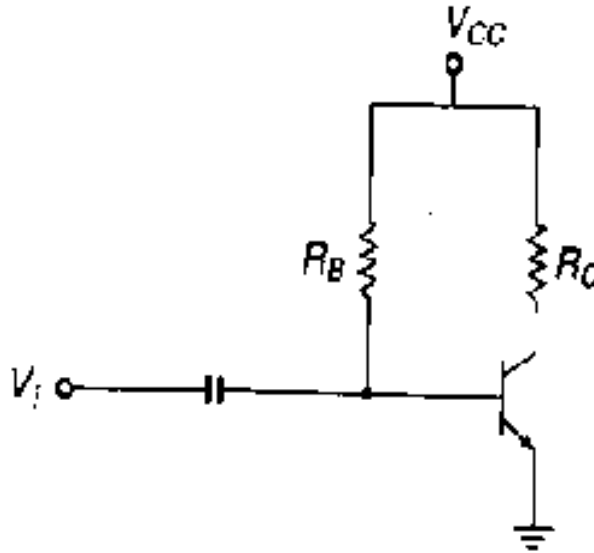
(OR)

8. a) Draw and explain BJT self bias circuit.   6M
   b) Determine the operating point for a silicon transistor biased by fixed bias   6M
   method with β=100, R_B=500 KΩ, R_C=2.5 KΩ and V_{CC}=20 V and draw DC
   load line

UNIT-V

9. a) Explain how the transistor works as a switch?   6M
   b) Compare different transistor amplifier configurations.   6M
   (OR)
10. a) Explain RC-phase shift oscillator with neat sketch.   6M
    b) In a Hartley oscillator, if L_1=20μH, L_2=2mH and variable capacitance.   6M
    Determine the range of capacitance values if the frequency is varied
    between 950 kHz and 2050 kHz.

AR18

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 crystallization of Metals.	6M
	b)	What is an ionic bond? Explain with an example. Also give characteristics of ionic solid.	6M

(OR)

2.	a)	Find the packing factor of BCC, HCP space lattices.	6M
	b)	Define Metallic bonding and its characteristics.	6M

UNIT-II

3.	a)	Explain the Hume Rothery rules for maximum solid solubility.	6M
	b)	What is Gibb's phase rule? Apply Gibb's phase rule for eutectic alloy.	6M

(OR)

4.	a)	Explain the following cooling curves with neat sketch indicating various salient points on it: i) Pure metal and ii) Solid solution	6M
	b)	With neat sketch explain the Iron-carbon equilibrium diagram showing all the salient features.	6M

UNIT-III

5.	a)	Distinguish the properties and applications of Nodular Cast Iron and Gray Cast Iron.	6M
	b)	State the effect of the following alloying elements in steel. i) Cr ii) Mo iii) Mn iv) V v) Al vi) Ti	6M

(OR)

6.	a)	Explain why fine grained materials have superior properties than coarse grained materials?	6M
	b)	What are cast Irons? Give the importance of cast irons in the metallurgical curriculum.	6M

UNIT-IV

7.	a)	Write about method of experiment and construction of TTT diagram of eutectoid steel.	6M
	b)	Distinguish between Normalising and Annealing process.	6M

(OR)

8.	a)	Explain different methods manufacturing of Metal Powders. What are the design considerations in Powder Metallurgy?	6M
	b)	Write short notes on flame hardening process.	6M

UNIT-V

9.	a)	What is meant by Creep? Explain any one creep mechanism in detail.	6M
	b)	Explain the composition, properties, and typical applications for any three types of Aluminum alloys.	6M

(OR)

10.	a)	Explain stress - strain curve of a mild steel work piece and explain the important points.	6M
	b)	Write a short note on Hardness Testing.	6M

AR18

CODE: 18ECT204   **SET-1**

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

SIGNALS & SYSTEMS
(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) Derive the expression for component vector of approximating the function [6M] f1(t) over f2(t) and also prove that the component vector becomes zero if the f1(t) and f2(t) are orthogonal.
   b) A rectangular function f(t) is defined by [6M]
   f(t)= 1 0<t<π
   = -1 π<t<2π
   Approximate this function by a waveform sin(t) such that the mean square error is minimum.

(OR)

2. a) Define and sketch the following elementary signals [6M]
   i). unit impulse signal ii) unit step signal
   b) Show that the functions sin nω0t and sin mω0t are orthogonal to each other [6M] for all integer values of m and n.

UNIT-II

3. a) Find the Fourier Transform of the following signals. [6M]
   (i) $x(t) = A \sin(2\pi\phi_c t)u(t)$ (ii) $x(t) = f(t) \cos(2\pi\phi_c t + \varphi)u(t)$
   b) Find the Trigonometric Fourier series for the periodic signal [6M]
   x (t) = t, 0 ≤ t ≤ 1 and repeats every 1 sec.

(OR)

4. a) Give the development of Fourier Transform from Fourier series. [4M]
   b) State and prove any four properties of continuous time Fourier Transform. [8M]

UNIT-III

5. a) Derive an expression for convolution integral. Use convolution integral to [6M] find the response y(t) of an LTI system with impulse response h(t) =u(t-1) to the input x(t)=e-2t u(t). Sketch your result.
   b) Explain the characteristics of an ideal LPF. All ideal filters are physically [6M] not realizable: justify

(OR)

6. a) Explain the characteristics of ideal LPF, HPF and BPF with neat sketches [6M]
   b) Obtain the conditions for distortion less transmission through a system. [6M]

UNIT-IV

7. a) Discuss the types of sampling with neat sketches. [8M]
   b) State and prove any two properties of auto correlation. [4M]

(OR)

8. a) Differentiate between Impulse sampling, Natural sampling and Flat top [8M] sampling. Explain how signals can be reconstructed from its samples
   b) State and prove any two properties of auto correlation [4M]

UNIT-V

9. a) Define the relationship between Z-transform and Fourier Transform. What [6M] do you understand by ROC?
   b) Find the Z-transform and ROC of the following [6M]

   (i) $x(n)=a^n \cos \omega_0 n\ u(n)$ (ii) $x(n)=a^n \sin \omega_0 n\ u(n)$ (iii) $x(n)=\left(\frac{1}{2}\right)^n u(-n)$

(OR)

10. a) State and prove any two properties of Laplace transform [6M]
    b) State the ROC properties of Laplace transform. [6M]

2 of 2

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AR18

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)	What are the advantages of FOSS over proprietary software's?	6M
	b)	List at least 6 proprietary software's and their FOSS alternatives in a table.	6M

(OR)

2.	a)	What are the differences between the python 2.x and 3.x versions?	4M
	b)	Explain about numeric data types in python with an example.	8M

UNIT-II

3.	a)	Discuss about any 4 string handling functions in python with examples.	8M
	b)	Distinguish mutable and immutable types in python with examples.	4M

(OR)

4.	a)	Write a python script to simulate a simple arithmetic calculator.	8M
	b)	What is the difference between 'String' and a 'List' in python? Explain with an example.	4M

UNIT-III

5.	a)	Explain 'List' and 'Tuple' data types with at least 2 in-built functions for each.	6M
	b)	Discuss about pass by reference and value in python with an example.	6M

(OR)

6.	a)	Write a python function to display the sum of elements in a list given by the user. Hint: if user input is [1,2,3,4,5], then display 15.	8M
	b)	Discuss about various file handling function in python with an example.	4M

UNIT-IV

7.	a)	Explain each of the Loop constructs in Perl with an example	6M
	b)	Explain the variable types in Perl with a suitable example .	6M

(OR)

8.	a)	Differentiate between the following control statements of Perl. i) If and unless ii) While and until iii) Next and last	9M
	b)	Explain the Perl parsing rules.	3M

UNIT-V

9.	a)	Explain how subroutines can be created ,called and how arguments can be passed with a suitable example	7M
	b)	Write a Perl program to take a list of files from the command line, and print out the number of words in each..	5M

(OR)

10.	a)	Write a Perl program to display the contents of a file.	7M
	b)	What is the difference between "Use" and "Require".	5M

AR16

SURVEYING
(Civil Engineering)

Time: 3 Hours   Max Marks: 70

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) What are the principles of surveying.   4M
   b) Explain the various types chains and their uses in chain surveying.   10M

(OR)

2. a) The bearings of the sides of a closed traverse ABCDE are as follows: 8M

Side	Fore bearing	Back bearing
AB	$105^0 15'$	$285^0 15'$
BC	$20^0 0'$	$200^0 0'$
CD	$229^0 30'$	$49^0 30'$
DE	$187^0 15'$	$7^0 15'$
EA	$122^0 45'$	$302^0 45'$

Compute the interior angles of the traverse

   b) Write a note on following terms: True meridian, True bearing, magnetic   6M
   meridian, arbitrary bearing ,fore bearing ,back bearing and magnetic
   declination

UNIT-II

3. a) Explain various operations in levelling surveying   7M

   b) The following consecutive readings were taken with a level and a 4 m   7M
   levelling staff on a continuously sloping ground at a common interval of 30 m
   on line AB.

Chainage(m)	0	30	60	90	120	150
Levelling staff reading(m)	0.585	0.930	1.95	2.845	3.645	3.930
station	A					B

The reduced level (RL) of station A is 50.00. Calculate the reduced levels at
all the points where the levelling staff is placed. Tabulate the results and
apply usual checks. Also determine the gradient of line AB. use rise and fall
method.

(OR)

4. a) Explain briefly sources of errors in levelling   6M
    b) The following observations were taken with dumpy level and four meter   8M
        levelling staff. The instrument was shifted after the fourth and seventh
        readings. The first reading was taken on a bench mark whose RL is 15.575m.
        Prepare a page of level book and calculate RLs of all the points. The
        observations were taken at every 30m interval. Also find out the gradient
        between first and last point. Use H.I. method. Observations are: 0.565, 1.250,
        1.675, 3.695, 0.125, 2.345, 3.245, 0.500, 1.785, and 2.535.

UNIT-III

5. a) Explain briefly temporary adjustment of theodolite   7M
    b) Explain about stadia method   7M

(OR)

6. a) Enlist the methods of measuring horizontal angles; explain measurement of   8M
        horizontal angle by Repetition method.
    b) The stadia reading with a horizontal sight on a vertical staff held 50m away   6M
        from a tachometer were 1.284 and 1.780.the object glass and trunnion axis of
        the tachometer was 15cm calculate the stadia interval.

UNIT-IV

7. a) Define traverse. Explain classification of traverse   7M
    b) Write a note on latitude and departure   7M

(OR)

8. a) Enlist and explain the included angle and deflection angle methods of   7M
        adjusting a traverse
    b) Explain errors in traversing   7M

UNIT-V

9. a) Determination of elevation of object when the base is inaccessible -the   6M
        object is vertical
    b) What are the elements of simple circular curve? Define with figure and give   8M
        their relationship.

(OR)

10. a) Derive a relation Determination of elevation of object when the base is   6M
        accessible the object is Vertical.
    b) Why are curves provided? State various types of curves with sketch.   8M

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AR16

CODE: 16EC2003   **SET-2**

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

SIGNALS AND SYSTEMS
(Electronics and Communication Engineering)

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

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 concepts of impulse function, unit step function and signum function   7 M
    b) Define mean square error and derive the expression for evaluating mean square error.   7 M

(OR)

2. a) Determine the period of the periodic sequence $x[n] = 2\sin(\pi n/10)$ 7 M
    b) Illustrate orthogonal vector space and orthogonal signal space and it's importance in signal analysis.   7 M

UNIT-II

3. a) Find the Fourier series expansion of halfwave rectified sine wave.   7 M
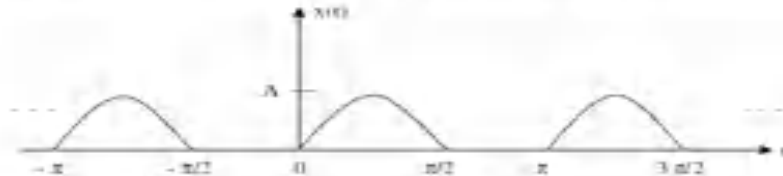
    b) State and prove differentiation property of Fourier transforms.   7 M

(OR)

4. a) Find the Fourier transform of signum function.   7 M
    b) Interpret about Dirchlet's condition.   7 M

UNIT-III

5. a) Define causality and physical realization of system. Also, explain about paley-wiener criterion for physical realization of system.   7 M
    b) Explain about causality and stability of an LTI system   7 M

(OR)

6. a) Derive the transfer function of a LTI system and hence explain filter characteristics of linear system.   7 M
    b) What do you understand by distortionless transmission? Explain   7 M

UNIT-IV

7. a) If $y(t) = x(t)*h(t)$ then show that $x(t-t_1)*h(t-t_2) = y(t-t_1-t_2)$ 7 M
   b) Explain briefly bandpass sampling.   7 M

(OR)

8. a) Determine the Nyquist rate for continuous time signal   7 M

   $X(t) = 6 \cos(50\pi t) + 20 \sin(300\pi t) + 10 \cos(100\pi t)$.
   b) Explain cross correlation and it's properties.   7 M

UNIT-V

9. a) Find the Laplace Transform of $f(t) = 3 \, t.e^{-4t} \cos(2(t-1))$.   7 M
   b) Explain briefly ROC and its properties with reference to Z-transforms   7 M

(OR)

10. a) Find Inverse Z- transform of $X(Z) = 3Z/(3Z+1)$ for different ROC conditions   7 M
    b) Find the inverse Laplace transform of $F(s) = 2/[(s+1)(s+5)]$ 7 M

AR16

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

ELECTRONIC DEVICES AND CIRCUITS
(Electrical and Electronics Engineering)

Time: 3 Hours   Max Marks: 70

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) With the help of Diode current equation, explain V-I Characteristics of Diode. (7M)
    b) Justify , why a zener diode can be used as a voltage regulator (7M)

(OR)

2. a) What is the need of a voltage rectifier? Explain the working of a full wave rectifier. (7M)
    b) Determine the peak and rms voltages on the secondary of a transformer connected across a full wave rectifier to provide no-load dc voltages of 9V. If the secondary winding source resistance is 3Ω, and dynamic resistance of each diode is 1Ω, determine the dc output across a load resistance of 100 Ω and 1K Ω. Also determine the percentage of regulation. (7M)

UNIT-II

3. a) Explain the current gains of a transistor in 3 configurations and give the relation among them. (7M)
    b) With the help of diagram, explain JFET working Principle and obtain the relation between I_d and I_{dss}. Also explain the Transfer and Drain Characteristics of a JFET (7M)

(OR)

4. a) Explain the working of a MOSFET in enhancement mode with the help of schematic diagram and also explain how it is different from Depletion mode MOSFET. (7M)
    b) Derive the equation for frequency of oscillation of UJT as a relaxation oscillator. (7M)

UNIT-III

5. a) What is biasing a transistor? What is the need of a stabilization circuit? State and draw any 3 biasing circuits of a transistor? (7M)
    b) Find Q point for the self bias circuit if Vcc=20V, β=49, R_E=100Ω, R_B=5K Ω. (7M)

(OR)

6. a) What is thermal run away and thermal stability? What are various methods of selection of operating point for a.c input signal? (7M)
    b) Derive the equation for stability factor in a voltage divider circuit (7M)

UNIT-IV

7. a) Derive the expressions for AV , AI , Ri ,Ro in terms of h-parameters of a   (7M)
        CE amplifier.
    b) Obtain the h-parameter conversion formulae for CB and CC configuration in   (7M)
        terms of CE configuration.

<p align="center">(OR)</p>

8. a)   (7M)
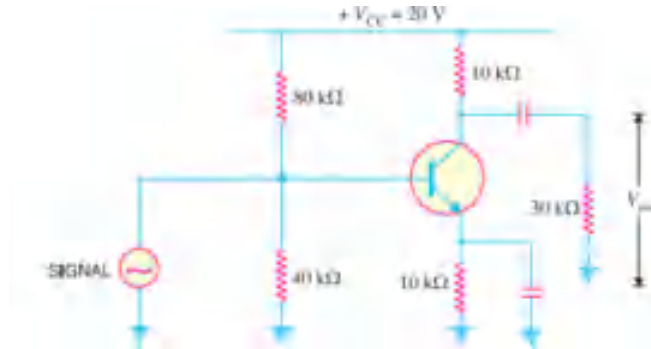
$h_{ie}=1500$, $h_{fe}=50$, $h_{re}=4*10^{-4}$, $h_{oe}=5*10^{-5}$
Find (i) ac input impedance of the amplifier (ii) voltage gain (iii) output
impedance
(iv) output impedance of entire amplifier.
    b) Draw the h parameter model of CB,CC and CE configurations and compare   (7M)
        the h parameter values of CE,CB and CC model.

UNIT-V

9. a) What is the effect of negative feedback on input and output   (7M)
        Resistances?
    b) Explain the working of RC Phase shift oscillator with Transistor   (7M)

<p align="center">(OR)</p>

10. a) Draw the circuit diagram and derive the expression for frequency of   (7M)
        oscillations of a Colpitts oscillator.
    b) Compare the positive and negative feedback in amplifiers.   (7M)

AR 16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, October-2021
ADVANCED ENGINEERING DRAWING

(Mechanical Engineering)

Time : 3 Hours   Max.Marks : 70

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 Square Pyramid base 30 mm side and axis 55 mm height is resting on one of its triangular

.   faces on the H.P. A Slant edge containing that face is parallel to the V.P. Draw the projections

of the solid using Auxiliary plane method.

(OR)

2. A regular Pentagonal Pyramid base 30mside and axis height 80 mm is resting one edge of its

base on the ground. The highest point in the base is 30mm above the ground. Draw the

projections of the solid using auxiliary plane method, when the axis parallel to the V.P.

UNIT-II

3. A Hexagonal Pyramid base 30 mm side and axis 70 mm height is resting in the H.P. with two

edges of base parallel to the V.P. It is cut by a section plane, inclined at 45^0 to the H.P.

and intersecting the axis at a point 25 mm above the base. Draw the Front view, Sectional top

view, sectional side view and true shape of the section.

(OR)

4. A triangular prism base 30mm side and axis 60 mm height is resting in the H.P. on one of its

rectangular faces with its axis inclined at 30^0 to the V.P. It is cut by a horizontal section plane,

parallel to H.P. and at a distance 12 mm above the ground. Draw Front view and Sectional top view.

AR 16

UNIT-III

5. A Cylinder base 50 mm diameter and axis 75 mm long is resting in the H.P. with its axis vertical
   It is cut by a horizontal section plane, parallel to the V.P. and 10 mm away from the axis. Draw the
   top view and sectional front view of the solid. Show difference between removed and retained parts

(OR)

6. A Cone base 50 mm diameteter and axis 70 mm long is resting in the H.P. with its axis vertical.
   It is cut by a horizontal section plane, parallel to the H.P. and passing through the axis 40 mm
   above the base. Draw the front view and Sectional Top view of the solid.

UNIT-IV

7. A Pentagonal Pyramid, base 30 mm side and axis 60 mm height is resting in the H.P. with its axis
   Vertical and one edge of base perpendicular to the V.P. It is cut by a section plane, inclined at 60^0
   with H.P. and bisecting the axis. Draw the development for lateral surface of the solid.

(OR)

8. A Cone base 60 mm diameter and axis 70 mm height is resting in the H.P. with its axis
   vertical. It is cut by a section plane inclined 45^0 with H.P. and passing through midpoint of axis.
   Draw the development for the lateral surface of truncated cone using radial line method.

UNIT-V

9. A Vertical Cylinder, base 60 mm diameter has a Square hole of 30 mm sides cut through it. The
   axis of the hole is horizontal, parallel to V.P. and 6mm away from the axis of the cylinder. The
   faces of Square hole are equally inclined to both H.P. and V.P. Draw the curves of intersection.

(OR)

10. A vertical Cone base 75 mm diameter and axis 100 mm is completely penetrated by a cylinder
    50 mm diameter. The axis of the cylinder is parallel to both H.P. and V.P. & intersects the axis of
    the Cone at a point 28 mm above the base. Draw the projections showing curves of intersection.

AR16

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

FREE OPEN SOURCE SOFTWARE
(Common to CSE & IT)

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

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	What are the advantages and disadvantages of Free open source System (FOSS)?	8M
	b	What is open source system? List few open source software.	6M
		(OR)	
2.	a	What is python? Explain the features of python.	6M
	b	Demonstrate identifiers and variables assignment in python with examples.	8M

UNIT-II

3.	a	Explain all the conditional statements in Python with an example for each.	9M
	b	Describe the rules and symbols are used with regard to statements in python.	5M
		(OR)	
4.	a	What are the numeric types supported by Python. How can we delete a number.	5M
	b	Explain the loops in python with example for each.	9M

UNIT-III

5.	a	How sequence elements are stored and accessed? Explain operators applicable to all sequence types.	8M
	b	Explain in-detail about string built-in methods in python.	6M
		(OR)	
6.	a	Explain in-detail about usage of Lists in Python.	8M
	b	How to Create and Assign Dictionaries. Explain in detail about it.	6M

UNIT-IV

7.	a	Explain the Perl syntax and parsing rules.	5M
	b	Demonstrate the arrays, hashes and lists in perl with examples.	9M
		(OR)	
8.	a	Explain in detail about the control statements in Perl	7M
	b	Demonstrate the for and foreach loops in Perl with examples.	7M

UNIT-V

9.	a	Explain in-detail about functions with arguments and return values in Perl.	9M
	b	Explain the main principal behind packages in Perl.	5M
		(OR)	
10.	a	Explain in-detail about how to creating and exporter module in Perl	8M
	b	Write a perl program to display the contents of a file.	6M

AR13

SET-2

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

SURVEYING
(Civil Engineering)

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

PART-A

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

1. a) Define Ranging
    b) Define whole circle bearing
    c) List methods of levelling
    d) Define horizontal equivalent
    e) List any four essential parts of theodolite
    f) List the methods for measuring horizontal angle
    g) Differentiate between level section and two-level sections
    h) List the methods for calculating volume of a reservoir.
    i) List the types of curves
    j) Define PC and PT in simple curve

PART-B

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

UNIT-I

2. Explain in detail about types of compass   12

(OR)

3. Explain different corrections that can be applied to chain or tape   12

UNIT-II

4. a) Explain in detail about characteristics of contouring   6
    b) Explain the interpolation of contours with neat sketch   6

(OR)

5. a) Explain the different types of levels   6
    b) Explain in detail about Temporary adjustment of Level   6

UNIT-III

6. Explain in detail about measurement of horizontal angle   12

(OR)

7. a) List the fundamentals lines of theodolite with neat sketch   6
    b) Explain in detail about basic terminology used in theodolite Surveying   6

UNIT-IV

8. Give the different formulas used for calculating irregular area   12

(OR)

9. Give the different formulas used for calculating cross-sectional area   12

UNIT-V

10. Explain in detail about setting out of simple curve using linear methods   12

(OR)

11. Explain in detail about essential components of compound curve   12

AR13

Time: 3 Hours   Max Marks: 70
PART-A
ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) Name any one type of crystal structure.
    b) What is packing density?
    c) Cu-Ni system is which type of phase diagram?
    d) Write the eutectic reaction in $Fe-Fe_3C$ phase diagram.
    e) Name any one tool steel with its composition.
    f) Give the composition of any one aluminium base alloy.
    g) Define "creep" property in any material.
    h) What is "fatigue" in a material
    i) Name any one method of production of metal powder in powder metallurgy.
    j) What is hot compaction?

PART-B
Answer one question from each unit   [5x12=60M]
UNIT-I

2. a) What are voids in crystals?   6M
    b) Explain metallic bond.   6M
                              (OR)
3. a) What are Line defects? Explain   6M
    b) Write about Deformation mechanism.   6M
UNIT-II

4. a) Explain any three types of phase diagrams in Iron carbon system.   6M
    b) Explain the solidification of alloys.   6M
                              (OR)
5. a) Draw the Iron carbon phase diagram.   6M
    b) Explain the solidification of pure metals.   6M

UNIT-III

6. a) Explain about Martensitic transformation in steel during heat treatment.   6M
    b) Draw the TTT diagram for steels during heat treatment.   6M
                              (OR)
7. a) Classify alloy steels.   6M
    b) Give a comprehensive classification of Cast irons.   6M

UNIT-IV

8. a) Write about "hardness" property of a material.   6M
    b) Differentiate between Engineering stress-strain curve vs. true stress strain   6M
        curve taking any ferrous material as an example.

(OR)

9. a) Write about toughness property of a material.   6M
    b) What are the properties evaluated by tensile testing procedure? Explain   6M

UNIT-V

10. a) Describe the steps involved in powder metallurgy through a flow chart.   6M
    b) Write about cold compaction with reference to powder metallurgy   6M

(OR)

11. a) Write about Processing of metal powders with respect to powder   6M
        metallurgy
    b) Write any three advantages and disadvantages of powder metallurgy.   6M

AR13

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

ELECTRONIC DEVICES AND CIRCUITS
(Electrical & Electronics Engineering)

Time: 3 Hours   Max Marks: 70
PART-A
ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) Define Diffusion Current
   b) Define Hall effect
   c) Define Avalanche breakdown.
   d) Reproduce the circuit of FWR with L-section filter
   e) Define Reach Through in a transistor
   f) Identify the configuration in which base width modulation occurs.
   g) State thermal Runaway
   h) Define h_{fe}
   i) Identify the basic amplifier used in voltage series feedback amplifier
   j) Show the circuit diagram of Hartley oscillator

PART-B

Answer one question from each unit   [5x12=60M]
UNIT-I

2. a) Define Mobility, Conductivity and Intrinsic Semiconductors & Extrinsic   6M
      Semi-Conductor.
   b) Explain the operation of PN diode with the help of diode equitation and   6M
      characteristic.
(OR)
3. a) Explain the operation of PN diode under Zero Bias, Forward Bias and Reverse   6M
      Bias
   b) Define Law of Junction, Fermi Level and Draw the energy band diagram of n-   6M
      type and p-type semiconductors indicating fermi level.
UNIT-II

4. a) Explain the operation of Zener diode mentioning the speciality of Zener   6M
      diode when compared to PN diode.
   b) Explain the operation HWR and derive the expression for efficiency   6M
(OR)

5. a) Determine (i) d.c. output voltage (ii) peak inverse voltage (iii) rectification   8M
      efficiency of a centre tapped FWR circuit. Assume the diodes are assumed
      to be ideal, turns ration is 5:1 and RL=100Ω.
   b) Explain the operation of LED.   4M

UNIT-III

6. a) Explain the operation of depletion mode MOSFET and draw its characteristics   6M

   b) Identify the current components present in the transistor and explain their significance.   6M

(OR)

7. a) Explain the operation of CB configuration and draw its input and output characteristics.   6M

   b) Explain the operation of UJT and draw its characteristics   6M

UNIT-IV

8. a) Compare CE ,CB and CC Amplifier configurations w.r.t voltage gain, current gain, Input resistance and output resistance   8M

   b) Derive the expression for stability factor of a Collector to Base Bias circuit.   4M

(OR)

9. a) Convert CE parameters in terms of CB parameters.   6M

   b) Define stability factors S, S', S''   6M

UNIT-V

10. a) Explain the operation of Colpitts oscillator.   6M

   b) List any five advantages and one disadvantage of negative feedback amplifier.   6M

(OR)

11. a) Derive the expression gain of an amplifier with negative feedback and find the gain and bandwidth of an amplifier with feedback. Assume the gain of an amplifier and bandwidth without feedback are 100 and 1500Hz, $1+A\beta=20$ 6M

   b) Show the block diagram of a current shunt feedback amplifier and explain the function of each block.   6M

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AR13

CODE: 13EE2003   **SET-2**

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

ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to CSE & IT Branches)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) Define Voltage.
    b) Define circuit.
    c) What is the Faraday's 2nd law?
    d) Applications of DC series generator.
    e) What are the applications of transformer?
    f) EMF equation of 1-phase transformer.
    g) Torque equation of PMMI instrument.
    h) What are the different types of torques involved in operation of any instrument?
    i) Diode applications.
    j) Symbol of PNP transistor.

PART-B

Answer one question from each unit   [5x12=60M]
UNIT-I

2. a) Find the equivalent resistance across the terminals A and B shown in figure. Also   6M
        determine the voltage across each resistor if 60V is applied across A and B
        terminals.
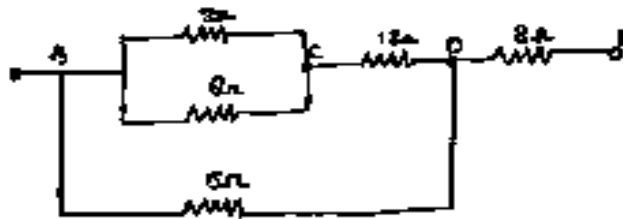
    b) Find the equivalent inductance.   6M
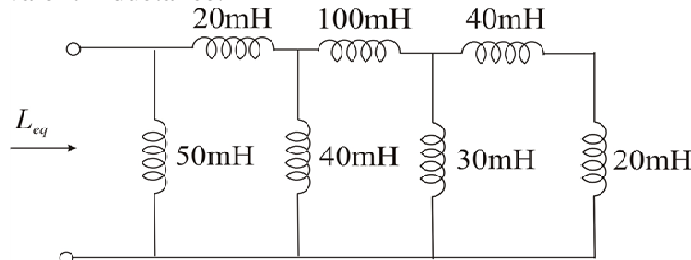
(OR)

3. a) Explain the different types of elements in an electrical circuit.   8M
    b) State the limitations of Ohm's law.   4M

1 of 2

CODE: 13EE2003 **SET-2**

UNIT-II

4. a) Derive the torque equation of DC motor. 6M
   b) A DC shunt machine develops an EMF of 250V at 1500rpm. Find the torque and 6M
   mechanical power developed if it draws an armature current of 50A.
   (OR)
5. a) Draw and explain open circuit characteristics of DC shunt generator. 6M
   b) Draw and write the necessary equations of shunt, long shunt and short shunt 6M
   compound DC generators.

UNIT-III

6. a) Derive the EMF equation of 1-phase transformer. 6M
   b) Compare shell type and core type transformers 6M
   (OR)
7. a) Explain why 3-phase induction motor is a self-starting machine? 6M
   b) Determine the slip and rotor speed of a 3-phase, 4 pole and 50 Hz induction motor 6M
   running at 1400 rpm.

UNIT-IV

8. a) List out the classification of measuring instruments. 6M
   b) Explain different mechanisms of damping torque. 6M
   (OR)
9. Derive the torque equation of PMMC instrument. 12M

UNIT-V

10. Describe the operation of bridge type rectifier with neat sketch. And derive 12M
    equations of average voltage and RMS voltage.
    (OR)
11. Explain the ON-time and OFF-time characteristics SCR. 12M