AR18

CODE: 18CET204 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Regular Examinations, October / November, 2019
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) Differentiate plan and map   6M
   b) What are the sources of error? Give one example of each.   6M
   (OR)
2. a) Describe various types of measuring chains? What are the   4M
      advantages of a chain over steel band?
   b) The following bearings were observed while traversing with   8M
      compass?

Line	F.B	B.B
AB	124° 30'	304°30'
BC	68°15'	246° 0'
CD	310°30'	135 °15'
DE	200°15'	17°45'

   Mention which stations are affected by local attraction and
   determine the corrected bearings

UNIT-II

3. a) What are the different types of levelling staves ?State merits   6M
      and demerits of each type.

b) The following staff readings were observed successfully with a level, the instrument having been moved after 3rd, 6th, and 8th readings: 2.255, 1.606, 0.900, 2.095, 2.860, 1.265, 0.600, 1.985, 1.055, 2.685 meters. 6M

Enter the above readings in a page of level book and calculate the R.L of points if the first reading was taken with a staff held on a benchmark of 450m

(OR)

4. a) Differentiate longitudinal and cross sectional levelling. 6M
   b) Explain characteristics of contouring 6M

UNIT-III

5. a) Explain Rankine's method of curves. 6M

   b) How do you measure horizontal angle by repetition method. 6M

(OR)

6. a) Determine the tachometric constants K and C. 6M
   b) Explain about purpose of total station in civil Engineering works 6M

UNIT-IV

7. a) What are the types of aerial photographs? 6M
   b) Explain about terrestrial phogametry 6M

(OR)

8. a) How do you plan flight movement in aerial photogrammetric 6M
   b) Derive expression for relief and tilt displacement 6M

UNIT-V

9. a) How do you collect remote sensing data acquisition 6M
   b) What are the advantages of GIS applications 6M

(OR)

10. a) What are applications of remote sensing 6M
    b) Explain about sensors; visual image interpretation 6M

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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) With a neat diagram explain the working of an open circuited   6M
        PN junction. Give Necessary response curves.
    b) How does a Zener diode maintain constant output voltage?   6M
    (OR)
2. a) What is a Tunnel diode? Explain the construction and   8M
        working with neat band diagrams? Draw its characteristics
    b) What are the applications of LED?   4M

UNIT-II

3. a) Draw the circuit of a half wave rectifier and explain its   8M
        working with input and output waveform
    b) Derive an expression for ripple factor for a full-wave rectifier   4M
        with LC-filter
    (OR)
4. a) Define transformer utilization factor and derive its expression   6M
        for i) Half wave rectifier ii) Full wave rectifier.
    b) A Full-wave rectifier is connected with an inductor filter,   6M
        derive expression for the ripple factor and draw relevant
        waveforms.

UNIT-III

5. a) Draw the input & output characteristics of an NPN transistors in CE configuration & explain.   8M
   b) Derive the relationship between α and β. Given I_E=2.5 mA, α=0.98 and I_{CBO}=10μA.Calculate I_B and I_C.   4M

(OR)

6. a) Explain the construction and working of Enhancement MOSFET.   6M
   b) Compare three transistor Configurations   6M

UNIT-IV

7. a) Define stability factor and discuss the factors that cause in stability of biasing circuit.   6M
   b) What are the compensation techniques used for V_{BE} and I_{CO}? Explain with the help of suitable circuits.   6M

(OR)

8. a) What is thermal runaway? What is the condition for thermal stability?   4M
   b) Explain different types of biasing techniques   8M

UNIT-V

9. a) Why do we prefer CE configuration for amplification?   6M
   b) Compare the performance of a transistor as an amplifier in CE, CB and CC configurations.   6M

(OR)

10. a) Derive the expression for frequency of oscillation of BJT RC phase-shift oscillator with necessary explanation.   8M
    b) In a Colpitts oscillator, if C_1=0.2μF, C_2=0.02 μF. If the frequency of oscillator is 10kHz, find the value of the inductor.   4M

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AR18

CODE: 18MET202   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Regular Examinations, October / November, 2019
MATERIALS ENGINEERING
(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

UNIT-I

1.	a)	Explain crystallization of metals? Draw the cooling curves for pure metal and alloy?	6M
	b)	Summarize different types of Bravi's lattices? Explain	6M

(OR)

2.	a)	Explain the principle of bond formation in solids, with a suitable example.	6M
	b)	What is the role of grain size on the properties of materials?	6M

UNIT-II

3.	a)	What is an interstitial solid solution, name the five elements which commonly form Interstitial solid solutions?	6M
	b)	Illustrate what is eutectic reaction? How does it differ from a eutectoid reaction?	6M

(OR)

4.	a)	Explain Hume-Rothary's rules.	4M
	b)	Draw Fe-Fe$_3$C phase diagram and explain the phase transformation reactions in the diagram.	8M

UNIT-III

5.	a)	Describe the micro structure, properties and application of White cast iron and Grey cast iron	6M
	b)	Classify various types of alloy steels	6M

(OR)

6.	a)	Describe the properties and applications of Medium carbon steel.	6M
	b)	State the effect of the following elements as alloying addition of steel i) Chromium ii) Molybdenum iii) Vanadium	6M

UNIT-IV

7.	a)	How does hardenability affect the heat treatment of an alloy?	6M
	b)	State the advantages and limitations of powder metallurgy	6M

(OR)

8.	a)	Describe the process of tempering & austempering.	6M
	b)	List the Characteristics of metal powders	6M

UNIT-V

9.	a)	Discuss about alpha & beta Titanium alloys.	8M
	b)	State the differences between Izod and Charpy tests.	4M

(OR)

10.	a)	Describe various properties of Engineering materials	6M
	b)	Describe and explain creep test.	6M

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AR18

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Regular Examinations, October / November, 2019
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) Determine whether the following signals are energy signals or power signals and calculate their energy or power   [8M]
   i) $x(t) = rect(t/2\tau)$ ii) $x(t) = tu(t)$
   b) Find the even and odd components of the signal $x(t)$ $= sin4t + 2sin4tcos4t + cos4t$ [4M]

(OR)

2. a) Show that the following signals are orthogonal over an interval [0,2] $x_1(t) = 4$ $x_2(t) = \sqrt{5}(1-t)$ [6M]
   b) Explain the following with example   [6M]
      i) Casual and non-causal systems
      ii) Stable and unstable systems

UNIT-II

3. a) What are the dirchilet's conditions for existence of Fourier series of a signal   [4M]
   b) Determine the trigonometric Fourier series of the function   [8M]
   $$x(t) = \begin{cases} \left(\frac{A}{\pi}\right)t & for\ 0 \leq t \leq \pi \\ 0 & for\ \pi \leq t \leq 2\pi \end{cases}$$

(OR)

4. a) Find the Fourier transform for the following standard signals   [8M]
      i) Impulse function $\delta(t)$ ii)Unit step function $u(t)$
   b) State and prove frequency shifting property of Fourier transform   [4M]

UNIT-III

5. a) Sketch and explain about ideal characteristics of [8M]
        LPF,HPF and BPF
    b) What are the conditions for distortion less [4M]
        transmission through a system
                            (OR)
6. a) Explain causality and physical realizability of a [6M]
        system and hence give poly-wiener criterion
    b) Illustrate the following [6M]
            i) Impulse response of a system
            ii) Transfer function of a system

UNIT-IV

7. a) State and prove sampling theorem for band-limited [8M]
        signals
    b) Compare energy density spectrum and power density [4M]
        spectrum
                            (OR)
8. a) Find the convolution of the following signals by [8M]
        graphical method
            $x(t) = e^{-2t}\ u(t)$ and $h(t) = u(t+6)$
    b) Explain the following i) Aliasing ii) Nyquist rate [4M]

UNIT-V

9.   a) Find the Laplace transform of the following signals [6M]
            i) $x(t) = \sin 4\pi t \cos 3\pi t\ u(t)$ ii) $x(t) = 1-e^{3t}/t$

     b) Find the Laplace transform of the signal $x(t) = e^{3t}$ [6M]
            $u(-t) + e^{4t}\ u(-t)$ and mention ROC.
                            (OR)
10. a) State the properties of ROC of Z-transform [6M]
    b) Find the Inverse Laplace Transform of the following [6M]
        functions
            i) $X(s) = (s+4)/(s^2+5s+6)$
            ii) $X(s) = 10s/(s^2+2s+2)$

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CODE: 18CST204   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Regular Examinations, October / November, 2019
FREE OPEN SOURCE SOFTWARE
(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) How many different ways are there to run Python? Which one is preferable one?   6 M
   b) What is Foss? How it differs from open source software   6 M

(OR)

2. a) Describe the features of python.   6 M
   b) Explain the rules of precedence used by python to evaluate an expression.   6 M

UNIT-II

3. a) List and give syntax of all python supported conditional statements along with its usage with an example program whether a given number is positive or negative or zero.   8 M
   b) Write a python program to print Fibonacci series up to the given limit   4 M

(OR)

4. a) What is numeric coercion. Explain the rules of numeric coercion.   6 M
   b) Write a python code to display the last six characters of the string " ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT"   6 M

UNIT-III

5. a) How tuples are created in python. Explain different ways of creating and accessing them.   6 M
   b) Differentiate between argument and parameter. Illustrate the flow of execution of python function with an example program to convert given Celsius to Fahrenheit temperature.   6 M

(OR)

6. a) Explain fundamental file operations in Python with code examples.   8 M
   b) Write a program to compare to text files. If they are different give the line number and column number of files where first difference occurs.   4 M

UNIT-IV

7. a) Explain arrays in perl with examples.   8 M
   b) Write a perl program to find sum of all even numbers from 1 to n.   4 M

(OR)

8. a) Write short on   9 M
       i) continue block ii) goto iii) Lables of perl
   b) Write a perl program to find the maximum between three numbers.   3 M

UNIT-V

9. a) Differentiate subroutines and functions. With an example explain how list and hashes can be passed as an arguments to subroutine.   8 M
   b) Write a perl program to copy content of one file to another.   4 M

(OR)

10. a) Explain about operators in perl.   6 M
    b) Describe about miscellaneous file control functions.   6 M

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, October / November, 2019

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) Explain the classification of survey.   7M
    b) Write briefly about chaining on uneven ground.   7M

(OR)

2. Calculate the corrected bearings of the following traverse   14M
    taken from a compass survey.

Line	F.B	B.B
AB	$80^0 10'$	259^0
BC	$120^0 20'$	$301^0 50'$
CD	$170^0 50'$	$350^0 00'$
DE	$230^0 10'$	$49^0 30'$
EA	$310^0 20'$	$130^0 15'$

UNIT-II

3. a) Explain briefly the temporary adjustments of a level.   10M
    b) Define profile levelling and cross- sectioning.   4M

(OR)

4. The following is the page of a level field book. Fill in the   14M
    missing readings and calculate the RL of all the points. Apply the
    usual checks.

Sta	BS	IS	FS	Rise	Fall	RL	Remarks
1	2.150					450.000	BM1
2	1.645		?	0.50			
3		2.34			?		
4	?		1.96	?			
5	2.050		1.82		0.40		
6		?		?		451.500	BM2
7	1.690		?	0.12			
8	2.865		2.10		?		
9			?	?		452.250	BM3

UNIT-III

5.   Explain the procedure for measurement of horizontal angles.   14M

(OR)

6. a) Explain the procedure for determining the values of   6M
tacheometric constants k and C.

   b) To determine the distance between two stations A and B, a   8M
tacheometer was setup at a point P on the line AB and the
following observations were made:

Staff was held at A	Staff was held at B
Staff readings = 2.225, 2.605, 2.985	Staff readings = 1.640, 1.920, 2.200
Vertical angle= +8° 24'	Vertical angle= -1° 06'

Also determine the RL of B if the RL of A is 315.673m.
(k=100.00, C=0)

UNIT-IV

7. a) What are check applied in closed traverse and explain.   4M

   b) Explain briefly any two common methods of adjusting a   10M
closed traverse.

(OR)

8.   In a traverse ABCDEFG, the line BA is taken as the reference   14M
meridian. The latitudes and departures of the sides AB, BC,
CD, DE and EF are:

Line	AB	BC	CD	DE	EF
Latitude	- 95.20	- 45.22	+ 47.24	+ 48.55	+ 87.78
Departure	0.00	+ 58.91	+ 63.74	-37.44	+ 29.63

UNIT-V

9.   Derive an expression to calculate elevation difference when   14M
base of object accessible.

(OR)

10.   Calculate the necessary data for setting out a circular curve   14M
of 350m radius by Rankine's method of deflection angles to
connect the two tangents intersecting at the chainage 1238m,
the deflection angle being 36°.Take the peg interval= 30m

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, October / November, 2019

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) Discuss on semiconductor energy band gap. (7M)
   b) Explain the working of a diode as a switch and obtain the switching times of a PN junction diode. (7M)

(OR)

2. a) Explain the working and V-I characteristics of a Tunnel diode (7M)
   b) Draw the circuit and output waveforms of a HWR. Derive the expressions for various important voltages, currents and %regulation of HWR. (7M)

UNIT-II

3. a) How early effect influences the input characteristics of a CB configuration? Represent all the regions of operation of CB configuration in the output characteristics. (7M)
   b) Justify the applications of CB, CE and CC configurations. (7M)

(OR)

4. a) Explain the working of a depletion mode MOSFET. How is it different from an enhancement mode MOSFET? (7M)
   b) Define I_{DSS} of a JFET. For a JFET, $V_{GS}(off) = -8$ V (maximum) and $I_{DSS} = 9$ mA. Using these values, determine the drain current for $VGS = 0$ V, -1 V, and -4 V. (7M)

UNIT-III

5. a) Discuss on the need and criteria for fixing the operating point (7M)

   b) Define Stability factor? What are the types of bias circuits for BJT amplifiers (7M)

(OR)

6. a) In a voltage divider circuit, if $R_1 = 50K\Omega$, $R_2 = 5\ K\Omega$, $R_C = 2\ K\Omega$ $R_E = 100\ \Omega$, Vcc = 20V, Find the stability factor, I_C, V_{CE}? (7M)

   b) Find the bias point (Si BJT with $\beta = 200$ (7M)
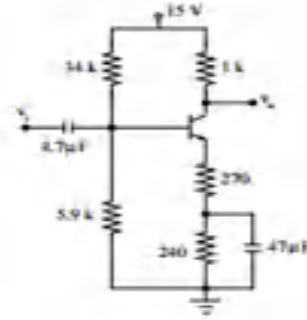
UNIT-IV

7. a) Draw the small signal equivalent model of CE configuration of an amplifier, and obtain the h-parameters of CE configuration. (7M)

   b) Derive the equations for the analysis of an amplifier in terms of A_V, A_I, R_i, R_o. (7M)

(OR)

8. a) For a common emitter configuration, what is the maximum value of R_L, R_1, if $R_2 = 8K\Omega$ and (7M)

   $h_{re} = 2.5 \times 10^{-4}, h_{fe} = 50, h_{ie} = 1100\Omega, h_{oe} = 2..5 \times 10^{-6}$

   b) A transistor has forward current gain of 0.99 when used in common base (CB) configuration. How much will be the current gain of this transistor in common emitter (CE) configuration and common collector (CC) configuration? (7M)

UNIT-V

9. a) What are the general characteristics of negative feedback amplifiers (7M)

   b) Analyze a voltage shunt feedback amplifier in terms of AV_f, AI_f, Ri_f, Ro_f (7M)

(OR)

10. a) Derive the equation for frequency of oscillations in a Hartley oscillator? (7M)

    b) Explain the working of a Wein bridge oscillator (7M)

AR16

CODE: 16ME2009   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, October / November, 2019

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 hexagonal prism, with the side of the hexagon 30 mm and height of 70 mm is resting on the H.P. on one of the edges of its hexagonal base in such a way that, the edge is at 60° to the V.P. and the base is at 30° to the H.P. Draw the view from the front and the view from the top by using Auxiliary projection method   14M

(OR)

2. A square pyramid of 50 mm side of base and 50 mm length of axis is resting on one of its triangular faces on the H.P. having a slant edge containing that face parallel to the V.P. Draw the projections of the pyramid by using Auxiliary projection method   14M

UNIT-II

3. A cube of 35 mm long edges is resting on the H.P. on one of its faces with a vertical face inclined at 30° to the V.P. The cube is cut by a section plane, inclined at 60° to the V.P. and perpendicular to the H.P.so that the face which makes 60° angle with the V.P. is cut in two equal halves. Draw the sectional front view, top view and true shape of the section.   14M

(OR)

4. A pentagonal pyramid, base 30mm side and axis 65mm long, has its base horizontal and an edge of the base parallel to the V.P. A horizontal section plane cuts it at a distance of 25mm above the base. Draw its front view and sectional top view.   14M

UNIT-III

5. A cylinder of 40 mm diameter, 60 mm height and having its axis vertical, is cut by a section plane, perpendicular to the V.P., inclined at 45° to the H.P. and intersecting the axis 32 mm above the base. Draw its front view, sectional top view, sectional side view and true shape of the section.   14M

(OR)

6. A cone, base 75 mm diameter and axis 80 mm long is resting on its base on the H.P.It is cut by a section plane perpendicular to the V.P. and parallel to and 12 mm away from one of its end generators. Draw its front view, sectional top view and true shape of the section. 14M

UNIT-IV

7. A hexagonal pyramid, base 30 mrn side and axis 75 mm long, resting on its base on the H.P. with two of its edges parallel to the V.P. is cut by two section planes, both perpendicular to the V.P. The horizontal section plane cuts the axis at a point 35 mm from the apex. The other plane which makes an angle of 45° with the H.P., also intersects the axis at the same point. Draw the development of the surface of the remaining part of the pyramid. 14M

(OR)

8 Draw the development of the lateral surface of the part 'P 'of the hexagonal prism shown in Fig. below
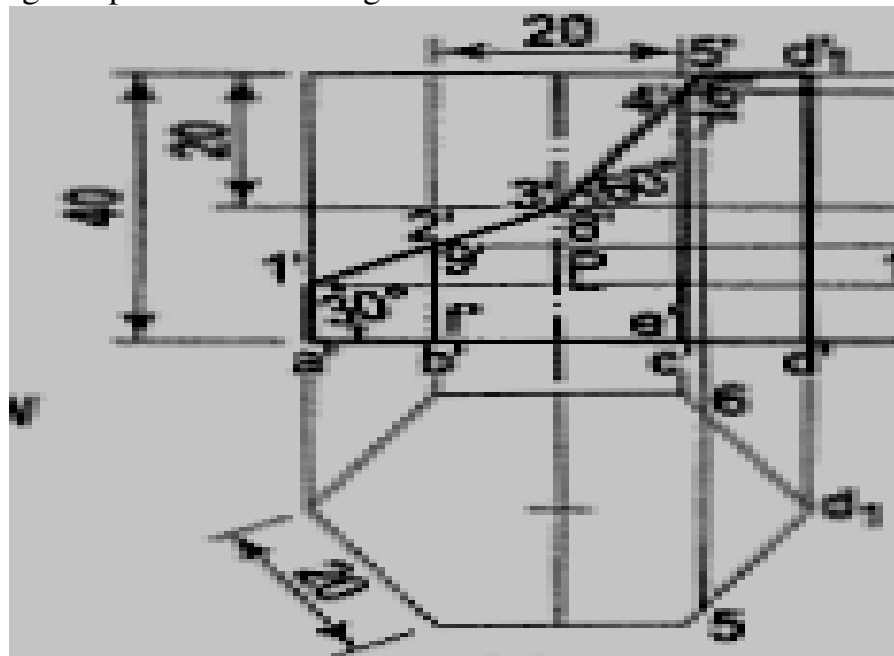
14M

UNIT-V

9. A Vertical cylinder of 80 mm diameter is completely penetrated by another cylinder of 60 mm diameter, their axes bisecting each other at right angles. Draw their projections showing curves of penetration, assuming the axis of the penetrating cylinder to be parallel to the V.P 14M

(OR)

10. A vertical square prism having its faces equally inclined to the V.P. is completely penetrated by a horizontal cylinder, the axis of which is parallel to the V.P. and 6 mm away from that of the prism. Draw the projections of the solids showing curves of intersection. The length of the sides of the base of the prism is 50 mm and the diameter of the cylinder is 40 mm. 14M

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, October / November, 2019

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) Illustrate how vector analogy with signal is useful for spectral or signal analysis.   7 M

(OR)

2. a) Determine whether the following function is periodic or not. $x(t) = 3\sin(200\pi t) + 4\cos(100\pi t)$. If so, find the period.   7 M

   b) Explain how a function can be represented by closed or complete set of mutually orthogonal functions.   7 M

UNIT-II

3. a) Determine the complex exponential Fourier series of periodic square wave.   7 M
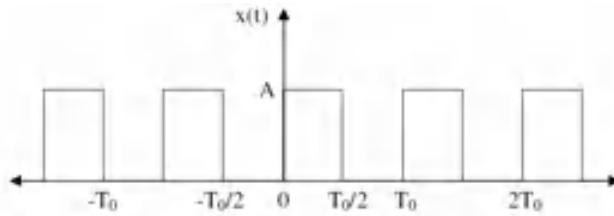
   b) State and prove time convolution property of Fourier transforms.   7 M

(OR)

4. a) Explain complex Fourier spectrum.   7 M

   b) State and prove differentiation property of Fourier transforms   7 M

UNIT-III

5. a) Check whether the following systems are linear time invariant 7 M
   systems or not   i)y(t)=sin(x(t)).   ii)y(t)= t x(t)

   iii) y(t)=t e^{-2t}

   b) Draw the ideal filter characteristics. What is the condition for 7 M
   reliability of these filters?

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

6. a) Obtain the conditions for distortion less transmission through 7 M
   system.
   b) Define the following: i) Signal bandwidth ii) System 7 M
   bandwidth iii) Causality of a filter

UNIT-IV

7. a) Derive the relation between auto correlation and PSD. 7 M
   b) Explain reconstruction of the signal from it's sampled signal. 7 M

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

8. a) Explain auto correlation and it's properties. 7 M
   b) State and explain sampling theorem for continuous signals. 7 M

UNIT-V

9. a) Explain various properties of ROC's for Laplace transforms. 7 M

   b) State and prove any two properties of Z- transform 7 M

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

10. a) Find the Laplace transform of x(t) and sketch pole-zero plot 7 M
   with ROC x(t)= e^{-3t} u(t) +   e^{2t} u(-t)

   b) Find Inverse Z- transform of X(Z)=Z/{(Z+2)(Z-3)} for 7 M

   different ROC conditions.

   i) 2<|Z|<3   ii) |Z|>3 iii) |Z|<3

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, October / November, 2019

FREE OPEN SOURCE SOFTWARE
(Computer Science & 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) Describe the advantages and disadvantages of FOSS.   5M
   b) Give a note on each of the below Python language constructs: 9M
      i)   Quotes (single, double and triple)
      ii) Multiline statements
      iii) Indentation.

(OR)

2. a) Explain about membership and identity operators with suitable examples?   7M
   b) Discuss about variables and assignments with suitable examples?   7M

UNIT-II

3. a) What are the different loop control statements available in Python? Explain with   9M
      suitable examples?
   b) Write a python program to print sum of even and odd numbers in a given range.   5M

(OR)

4. a) Write a note on the following python statements with suitable examples   9M
      i) Pass   ii) range   iii) break
   b) Write a python program to print Fibonacci series up to 1000.   5M

UNIT-III

5. a) Discuss the basic Tuple operations with examples.   7M
   b) Discuss about file input and output functions in python with examples?   7M

(OR)

6. a) How to create dictionaries in python? Write are the built-in methods available in   9M
      dictionaries in python? Give some suitable examples?
   b) Write a python program to create two lists to all even numbers in to one list and all odd   5M
      numbers in to another list.

UNIT-IV

7. a) Write a PERL program to print n prime numbers in a given range.   5M
   b) Describe the various types of variables available in PERL with examples?   9M

(OR)

8. a) Discuss the Perl parsing rules with suitable examples?   5M
   b) Explain all available conditional statements in PERL with suitable examples?   9M

UNIT-V

9. a) How to call and identify a subroutine in Perl? Explain with examples?   7M
   b) How to create modules in PERL. Give examples?   7M

(OR)

10. a) Explain with an example how to open and read data files with Perl?   7M
    b) Show how to create packages in PERL. Give examples?   7M

AR13

CODE: 13CE2002 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, October / November, 2019

SURVEYING
(Civil Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) Explain the principle on which chain survey is based.
    b) Differentiate between Angle and Bearing
    c) What is Profile Levelling?
    d) Write the distance formula for staff vertical position
    e) Differentiate between plunging and swinging of telescope.
    f) State the various rules used to do balancing a traverse.
    g) What are the uses of a contour map?
    h) State and prove Trapezoidal rule.
    i) How to calculate horizontal distance by using tachometer?
    j) Deduce the relationship between the degree and radius of a curve?

PART-B

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

UNIT-I

2. a) What is Reciprocal ranging? Explain in detail.   6 M
    b) What are corrections to be applied for chain? Explain with related formulae   6 M

(OR)

3. a) What is meant by local attraction and how it is detected?   5 M
    b) The following bearings were observed with a compass. Calculate the interior angles. 7 M

Line	AB	BC	CD	DE	EA
Bearing	$60^0 30'$	122^0	46^0	205^0	300^0

UNIT-II

4. The following consecutive readings were taken with a level and 3 m leveling staff   12 M
    on continuously sloping ground at a common interval of 20 meters: 0.602, 1.234,
    1.860, 2.574, 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 the gradient of
    the line joining the first and last points.

(OR)

5. What is meant by contouring? Describe the various methods of contouring   12 M

6. a) Explain how would you measure horizontal and vertical angles with a theodolite. 5 M

    b) The following observations were made on a hilltop to ascertain its elevation. The height of the target F was 5 m. Find the R.L. of top of hill. 7 M

Instrument station	Staff reading on B.M.	Vertical angle on target at hilltop	Remarks
A	2.550	18°06′	R.L. of B.M =
B	1.670	28°42'	345.580 m

The instrument stations were 100 m apart and were in line with F.

(OR)

7. a) A line was measured tachometrically with a tachometer fitted with an analytic lens, the value of the constant being 100. The following observations were made, the staff being held vertically. Determine the elevations of A, B and C. 7 M

Instrument Station	Height of Axis	Staff at	Vertical angle	Staff Readings			Remarks
				Bottom	Centre	Top	
1	1.38	A	$-1^0 54'$	1.020	1.720	2.420	RL
2	1.38	B	$+2^0 36'$	1.220	1.825	2.430	
3	1.40	C	$+3^0 06'$	0.785	1.610	2.435	

RL at station 1 = 638.550 (BM)

    b) What is meant by 'face left' and 'face right' position of theodolite? How would you change face? 5 M

UNIT-IV

8. a) Draw the sketch of a two level section, and derive an expression for the area of cross-section. 5 M

    b) A track of land has three straight boundaries AB,BC and CD the fourth boundary DA is irregular. The measured length are as under: AB=145m, BC=195m, CD=129m, BD=260m. The offsets measured outside the boundary DA to the irregular boundary at a regular interval of 30 m from D, are as below: 7 M

Distance from D (m)	0	30	60	90	120	150	180
Offset (m)	0	3.8	4.8	4.4	0.8	3.6	0

Determine the area of the track.

(OR)

9. A railway embankment 400m long is 12m wide at the formation level. The side slope of the embankment 2:1. The formation level at zero chainage is 107.00. The embankment has a rising gradient of 1 in 100. The ground is level across the c/l. Calculate the volume of earthwork using the prismoidal rule with the following observations. 12 M

Distance (m)	0	100	200	300	400
R.L. (m)	104.8	106.2	107.5	107.2	108.3

UNIT-V

10. a) Two straight AB and BC are intersected by a line D_1D_2.The angles BD_1D_2 and BD_2D_1 are 40°30'and 36°24' respectively. The radius of the first arc is 600 m and that of the second arc is 800 m. If the chainage of intersection point B is 8248.10 m, find the chainages of the tangent point and the point of compound curvature? 8 M

    b) Derive relationship between the radius and the degree of curve. 4 M

(OR)

11. a) Define the following terms of a simple circular curve. 6 M

       (i) Point of curvature (ii) Point of tangency and (iii) External distance

    b) What is a compound curve? Derive relationships between various elements of a compound curve. 6 M

Code: 13EE2003

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, October / November, 2019
ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to CSE & IT Branches)

Time-3 hours   Max. Marks: 70

PART-A

Answer all questions   [10x1=10M]

1) a) What is meant by Voltage?
   b) State Ohm's Law.
   c) Distinguish between a mesh and a note of a circuit.
   d) Give some applications of DC motor.
   e) What is the use of commutator and brush in a d.c machine?
   f) Why a series motor cannot be started without any load?
   g) What is meant by transformer?
   h) What are the applications of MI instruments?
   i) Define Instrument.
   j) Diode Applications.

PART-B

Answer One Question from Each Unit   [5X12=60M]

UNIT-I

2) a) State and Explain KVL & KCL with Example.   [6M]
   b) What is meant by inductor? And write its properties also derive energy storage in an
      inductor.   [6M]

(OR)

3) a) Derive the formula for a delta connected resistor network is converted into a
      star connected resistor network?   [6M]

   b) Find the equivalent resistance of the circuit shown below
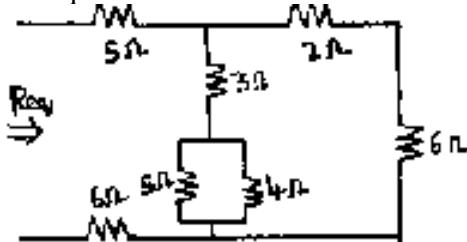
                                                                  [6M]

UNIT-II

4) a) Explain different losses in DC Machine. [6M]

   b) Derive the EMF equation of a D.C generator. [6M]

(OR)

5) Explain the necessity of 3-point starter and briefly explain the principle of operation with neat diagram. [12M]

UNIT-III

6) a) Explain the constructional details and operation of induction motor [6M]

   b) Explain the working principle of a transformer. [6M]

(OR)

7) a) Draw the torque –slip characteristics of induction motor. [6M]

   b) A 3 φ 4 pole 50 Hz induction motor runs at 1460 r.p.m. find its % of slip. [6M]

UNIT-IV

8) Describe the construction and working principle of PMMC instrument and Derive an Expression of the deflecting torque. [12M]

(OR)

9) a) Distinguish between MC and MI instruments. [6M]

   b) Explain different torques required for satisfactory operation of indicating instruments. [6M]

UNIT-V

10) a) Explain the operation of NPN and PNP transistor. [6M]

    b) Explain v& I characteristics of SCR [6M]

(OR)

11) Explain transistor working as an amplifier [12M]

AR13

CODE: 13ME2006   SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, October / November, 2019

ENGINEERING METALLURGY & MATERIAL SCIENCE
(Mechanical Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

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

1. a) What is an Ionic Bond?
    b) Define Unitcell.
    c) What is an allotropy?
    d) What is peritectic reaction?
    e) What is a critical cooling rate?
    f) What are the constituents of the maraging steels?
    g) Define Creep.
    h) What is ductility?
    i) Define powder metallurgy process.
    j) Mention any two applications of powder metallurgy.

PART-B

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

2. a) What is solid solution? With suitable example explain   6M
        different types of solid solutions.
    b) Represent the following directions and plane in a crystal   6M
        lattice:

        i) (1 1 1)   ii) (1 0 1)   iiii) [1 2 3]
                              (OR)
3. a) What is a metallic bond? Explain with an example. Also give 6M
        characteristics of metallic bond.
    b) Explain interstitial compounds, Inter metallic compounds and 6M
        electron compounds.

UNIT-II

4. What are principles mechanisms of solidification?   12M

(OR)

5. a) With a neat sketch explain isomorphous alloy system and eutectic system with an example.   6M

   b) List and explain three reactions present in the Fe-Fe$_3$C equilibrium diagram.   6M

UNIT-III

6. a) Give any two properties and applications of each of the following: 6M

   i) Tool steels   (ii) Die steels   (iii)Stainless steels.

   b) Explain about CCT diagram.   6M

(OR)

7. a) Discuss in brief, the properties and applications of any four Titanium alloys.   8M

   b) Write a short note on: (i) Annealing   and   4M
   ii) Normalizing.

UNIT-IV

8. What is meant by Creep? Explain different Creep Mechanisms?   12M

(OR)

9. Define the following properties with examples: 12M
   i) Impact strength   ii) Toughness   iii) Fatigue   and
   iv) Stiffness.

UNIT-V

10. a) Distinguish between impregnation and infiltration process.   4M

    b) What are various characteristics of metal powders? Explain them in detail.   8M

(OR)

11. What is compaction? Classify the compaction techniques and explain any three of them in detail with a neat sketch.   12M

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AR13

PART-A
ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) What is the classification of the systems?
   b) What is aliasing.
   c) Define the shifting property of the discrete time unit Impulse function.
   d) State the Sampling theorem.
   e) When is a system said to be memory less? Give an example.
   f) What is the Fourier transform of a DC signal of a amplitude 1?
   g) What is ROC in Z-Transform.
   h) What is meant by impulse response of any system.
   i) State initial value theorem of Laplace transform.
   j) Write n^{th} order difference equation.

PART-B

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

2. A rectangular function is defined as   **12**

$$f(t) = \begin{cases} A, & 0 < t < \pi/2 \\ -A, & \pi/2 < t < 3\pi/2 \\ A, & 3\pi/2 < t < 2\pi \end{cases}$$

   Approximate the above function by $A\cos t$ between the intervals $(0,2\pi)$ such that the mean square error is minimum.

(OR)

3. Show that f(t) is orthogonal to signals cost, cos2t, cos3t,... cosnt for all integer   **12**
   values of n n≠0, over the interval $(0,2\pi)$ if
   $$f(t) = \begin{cases} 1, & 0 < t < \pi \\ -1, & \pi < t < 2 \end{cases}$$

1 of 2

UNIT-II

4.   Find the exponential Fourier series for the full wave rectifier sine wave as shown   **12**
below for the interval $(0,2\pi)$ with an amplitude of ' A'.
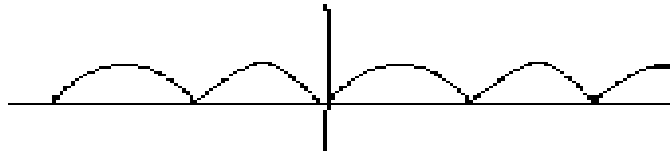
(OR)

5.   Find the fourier transform of   **12**

    a)$\cos\omega t\, u(t)$ b)$\sin\omega t\, u(t)$ c) $\cos(\omega t + \phi)$ d) $e^{-j\omega t}$

UNIT-III

6. a   Explain the ideal and practical LPF, HPF and BPF characteristics?   **6**
   b   Explain causality and poly wiener criterion for physical realization.   **6**
          (OR)
7. **a**   Explain distortionless transmission through a system   **6**
  b   Write short note on signal bandwidth, system bandwidth.   **6**

UNIT-IV

8. a   Explain the process of reconstruction of signal from its samples.   **5**
   b   Suppose that the signal $x(t)=u(t+0.5) - u(t-0.5)$ and the signal $h(t)=e^{j\omega t}$. Determine   **7**
the value of ω which ensure that $y(0)=0$, where $y(t)=x(t)*h(t)$
          (OR)
9. **a**   Find the convolution of the function x(t) and y(t) as shown below.   **8**
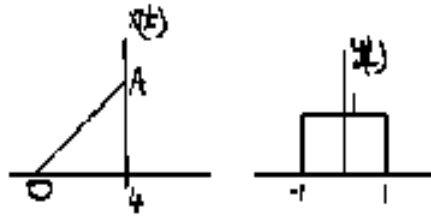
  b   Explain the effect of under sampling - Aliasing.   **4**

UNIT-V

10. a   Find the inverse Laplace transform of the functions   **10**

    a) $10s/(s+2)^2(s+8)$ b) $10s/(s+2)^3(s+8)$

   b   List the properties of ROC of Laplace transforms .   **2**

(OR)

11.   Find the Z-transform of the following sequences   **12**

    a) $x[n]=a^{-n}u[-n-1]$ b) $x[n]= u[-n]$ c) $x[n]= -a^n u[-n-1]$