R16

SET - 1

I B. Tech II Semester Regular Examinations, April/May - 2017
ENGINEERING PHYSICS
(Com. to CE, ME, CHEM, AE, BIO, AME, MM, PE, PCE, MET)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**

~~~~~~

PART –A

1. a) Why two different light sources can't act as coherent sources?   (2M)
   b) Why diffraction of light is not evident in daily life?   (2M)
   c) Define O-ray and E-ray.   (2M)
   d) How is laser different from an ordinary light?   (2M)
   e) What is reverberation time?   (2M)
   f) Draw (110) & (211) planes in a cubic crystal.   (2M)
   g) Why magnetic susceptibility of dia magnetic materials is negative?   (2M)

PART –B

2. a) Explain the formation of Newton's rings and derive the expression for diameter   (10M)
      of the dark rings in the reflected light. Also show that rings are not equally spaced.
   b) In a Newton's rings experiment, the diameters of 5th and 15th dark rings are   (4M)
      0.336cm and 0.59cm respectively. If the radius of curvature of plano-convex lens
      is 100cm, find the wavelength of monochromatic light. What happens to ring
      diameters if air film is replaced with liquid of refractive index 1.33.

3. a) What is plane diffraction grating? Obtain an equation to find the wavelength of   (10M)
      light using plane diffraction grating. What are the advantages of increasing
      number of lines in a grating?
   b) Write the differences between interference and diffraction.   (4M)

4. a) Explain the principle, construction and working of Nicol prism. Describe how it   (7M)
      can be used as polarizer.
   b) Write the differences between spontaneous and stimulated emissions? What is the   (7M)
      necessity of population inversion in achieving lasing action?

5. a) What are ultrasonics? Explain a method with a neat diagram to produce   (10M)
      ultrasonics.
   b) Explain the basic requirements of acoustically a good hall.   (4M)

6. a) What are Miller indices? How they are obtained? What is their importance?   (7M)
   b) What is Nuclear fission? Explain about the chain reactions.   (7M)

7. a) What are ferromagnetic materials? Discuss their properties and applications.   (6M)
   b) Calculate the expression for internal field of a dielectric material.   (8M)

|"|'|||||''|''||'|||

R16

SET - 2

I B. Tech II Semester Regular Examinations, April/May - 2017
ENGINEERING PHYSICS
(Com. to CE, ME, CHEM, AE, BIO, AME, MM, PE, PCE, MET)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**

~~~~~~

PART –A

1. a) Write any two applications of Newton's rings.   (2M)
   b) Write any two differences between interference and diffraction.   (2M)
   c) What is the difference between unpolarized and polarized light?   (2M)
   d) What is the role of a metastable state in lasers?   (2M)
   e) Write any two applications of ultrasonics.   (2M)
   f) Silver has FCC structure and iron has BCC structure. Identify which one has   (2M)
      primitive unit cell.
   g) Define dielectric loss and dielectric strength.   (2M)

PART –B

2. a) Why circular fringes are observed in Newton's rings? Explain the procedure for   (10M)
      determination of wavelength of a monochromatic light using Newton's rings
      experiment. Which method (Newton's rings or Interferometer) is better to find
      the wavelength of monochromatic light? Why?
   b) Describe the method to determine refractive index of a material using Newton's   (4M)
      rings.

3. a) Explain the Fraunhoffer diffraction due to single slit. Obtain the conditions for   (10M)
      maxima and minima.
   b) In the diffraction grating, what is effect of total number of lines and width of   (4M)
      grating on the spectrum.

4. a) With a neat diagram, explain the construction and working of He-Ne laser.   (10M)
   b) Explain any two methods to produce plane polarized light.   (4M)

5. a) Explain in detail the Non destructive testing (NDT) using ultrosonics.   (4M)
   b) Derive Sabine's formula for reverberation time.   (10M)

6. a) Derive the relation between interplanar distance and Miller indices of the planes   (10M)
      of a cubic crystal.
   b) Silver has FCC structure and its atomic radius is 1.441Å. Find the spacing of   (4M)
      (220) planes.

7. a) Classify the magnetic materials in atomic point of view.   (4M)
   b) What is dielectric breakdown? Explain different kinds of dielectric breakdown   (10M)
      mechanisms.

|"|'|||||"|"||'|||

R16

SET - 3

I B. Tech II Semester Regular Examinations, April/May - 2017
ENGINEERING PHYSICS
(Com. to CE, ME, CHEM, AE, BIO, AME, MM, PE, PCE, MET)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**
~~~~~~

PART –A

1. a) Write the principle of Superposition. (2M)
   b) In a Newton's rings experiment, why we choose a plano convex lens of larger radius of curvature? (2M)
   c) Define Mass defect and binding energy. (2M)
   d) What is a quarter wave plate? (2M)
   e) What is meant by non-destructive testing? (2M)
   f) Define the terms primitive and non-primitive unit cells. (2M)
   g) What are ferroelectrics? (2M)

PART –B

2. a) Why the Newton's rings are circular and central fringe is dark? Show that fringes are unequally spaced. Explain the determination of wavelength of monochromatic light using Newton's rings experiment. (10M)
   b) In Michelson's interferometer 200 fringes crossed the field of view when the movable mirror is displaced through a distance of 0.0589mm. Find the wavelength of light used. (4M)

3. a) Explain the Fraunhofer's diffraction due to a double slit. Explain the intensity distribution curve. (10M)
   b) Write the differences between Fresnel's and Fraunhoffer's diffractions. (4M)

4. a) Explain the construction and working of a polarimeter. (7M)
   b) Describe the construction and working of Ruby laser with a neat energy level diagram. (7M)

5. a) Write notes on absorption coefficient of a material and its measurement. (7M)
   b) Explain the production of ultrasonics by any one method. (7M)

6. a) What are Miller indices? Explain their role in the crystal structures. Draw the crystal planes having Miller indices (100), (111), (211). (10M)
   b) Write about controlled and uncontrolled chain reactions. (4M)

7. a) Explain the hysteresis of ferromagnetic materials. How it can be used to select materials for construction of permanent magnets? (9M)
   b) What are ferroelectric materials? How they are different from dielectric materials? (5M)

|'''|'|''||||''|''||'|||

R16

SET - 4

I B. Tech II Semester Regular Examinations, April/May - 2017
ENGINEERING PHYSICS
(Com. to CE, ME, CHEM, AE, BIO, AME, MM, PE, PCE, MET)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**

~~~~~~

PART –A

1. a) Why the central fringe is dark in Newton's rings experiment? (2M)
   b) What is diffraction grating? (2M)
   c) What is difference between Polarimeter and Saccharimeter? (2M)
   d) Write any two industrial applications of ultrasonics. (2M)
   e) Lead is face centered cubic with atomic radius of 1.746Å. Calculate the interplanar spacing of (200) plane. (2M)
   f) Explain the Hysteresis of Ferro magnetic materials. (2M)
   g) Define dielectric constant and dielectric loss. (2M)

PART –B

2. a) What is thin film? Derive the expressions for maxima and minima for reflected light in case of transparent film of uniform thickness. (10M)
   b) What will happen if the plano convex lens in the Newton's rings experiment is lifted up by $\lambda/2$, where λ is wavelength of monochromatic light used? (4M)

3. a) What is resolving power of a grating? Obtain an expression for resolving power of a diffraction grating and prove that it is independent of grating element. (10M)
   b) Calculate the maximum order of diffraction possible with a plane transmission grating having 15000 lines/inch and light of wavelength 6000 Å. (4M)

4. a) Explain the principle, construction and working of Nicol prism. (6M)
   b) Explain construction and working of He-Ne laser with a neat energy level diagram. (8M)

5. a) State and explain the acoustic requirements of a concert hall. (4M)
   b) Explain the production of ultrasonics by Magnetostriction method. Write its merits and demerits. (10M)

6. a) State and derive Bragg's law. Calculate the longest wavelength that can be analyzed by rock salt crystal of spacing 2.82 Å in the first order. (10M)
   b) Distinguish between fission and fusion reactions. Explain. (4M)

7. a) Discuss temperature dependence of susceptibility of para and ferro magnetic materials. (4M)
   b) Derive Clasius-Mossoti relation. Calculate the ratio between electronic and ionic polarizability of a dielectric having $\mathcal{E}$= 4.94 and n^2=2.69. Where '$\mathcal{E}$' is dielectric constant and 'n' is refractive index. (10M)

1 of 1

R16

SET - 1

I B. Tech II Semester Regular Examinations, April/May - 2017
OBJECT ORIENTED PROGRAMMING THROUGH C++
(Com. to CSE, IT)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

~~~~~~

PART –A

1.	a)	What is a class? Give an example.	(2M)
	b)	Define scope and lifetime of a variable.	(2M)
	c)	What is a virtual base class?	(2M)
	d)	What is a dereferencing Operator?	(2M)
	e)	What features of C++ enable polymorphism?	(2M)
	f)	What is an iterator in STL?	(2M)
	g)	What is a copy constructor?	(2M)

PART -B

2.	a)	List the drawbacks of conventional programming. Explain how object oriented programming overcome them.	(7M)
	b)	Explain about polymorphism and encapsulation.	(7M)
3.	a)	What are recursive constructors? Explain with an example.	(7M)
	b)	Define inline function. Write a C++ program for finding the area of a triangle using inline functions.	(7M)
4.	a)	What is inheritance? Present the advantages and disadvantages of inheritance.	(7M)
	b)	Write C++ Program to overload + operator to add two matrices.	(7M)
5.	a)	What is a virtual destructor? Explain with an example.	(7M)
	b)	Explain the role of this pointer in C++ with a programming example.	(7M)
6.	a)	Write a C++ program to add two integers, two floating point numbers and two complex numbers using class templates.	(7M)
	b)	Explain how to catch multiple exceptions in C++.	(7M)
7.	a)	Write a function template for finding the minimum value in an array.	(7M)
	b)	Discuss about STL programming model.	(7M)

|''|'|''||''|'|''|'||'|'||

I B. Tech II Semester Regular Examinations, April/May - 2017
OBJECT ORIENTED PROGRAMMING THROUGH C++
(Com. to CSE, IT)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
~~~~~~

PART –A

1. a) Define a class and an object.   (2M)
   b) With an example, explain the purpose of scope access operator.   (2M)
   c) List some C++ operators that cannot be overloaded.   (2M)
   d) How to declare a pointer in C++?   (2M)
   e) What is the primary difference between early binding and late binding?   (2M)
   f) What is an algorithm in STL?   (2M)
   g) Write the purpose of a destructor.   (2M)

PART –B

2. a) List the similarities and differences between C and C++.   (7M)
   b) Write about inheritance and abstraction.   (7M)

3. a) What is function overloading? What are the principles of function overloading?   (7M)
   b) Write C++ Program that demonstrates the usage of static data member and static   (7M)
      member function.

4. a) Explain hybrid inheritance with a C++ example.   (7M)
   b) Explain the concept of Data hiding in C++, with suitable examples.   (7M)

5. a) What is a virtual base class? Why it is important to make a class virtual?   (7M)
   b) Write a C++ program that declare and use pointer to a class.   (7M)

6. a) Explain the concept of Class Template with overloaded operators.   (7M)
   b) Write a C++ program that implements Bubble Sort using function templates.   (7M)

7. a) Write a C++ program to insert elements into a map.   (7M)
   b) Explain different ways of initializing a vector with programming examples.   (7M)

|''|'|''||''|''||'''

R16

SET - 3

I B. Tech II Semester Regular Examinations, April/May - 2017
OBJECT ORIENTED PROGRAMMING THROUGH C++
(Com. to CSE, IT)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

~~~~~~

PART –A

1. a) List some operators in C++, which are not present in C.   (2M)
    b) What is a constructor?   (2M)
    c) What is a friend function?   (2M)
    d) Define namespace.   (2M)
    e) How is polymorphism achieved at runtime?   (2M)
    f) What is a list in C++ STL?   (2M)
    g) What happens if we declare all member functions as private in a class?   (2M)

PART –B

2. a) Explain the key concepts of Object Oriented Programming.   (7M)
    b) Briefly write about the evolution of C++.   (7M)

3. a) Write C++ program to find the area of a circle, rectangle and triangle using   (7M)
        function overloading.
    b) What is a constructor? Write different rules associated with declaring constructors. (7M)

4. a) What is code reusability? Explain different C++ features that enable reusability. (7M)
    b) Write about operator overloading in C++ with an example.   (7M)

5. a) What is dynamic binding? How it is different from static binding? List some   (7M)
        advantages of dynamic binding over static binding.
    b) List and explain the rules associated with virtual functions.   (7M)

6. a) Define template. What is the need for templates in programming? Write C++ code   (7M)
        that declares a Template class.
    b) Write a C++ program that catches any math exception.   (7M)

7. a) Explain the components of Standard Template Library (STL).   (7M)
    b) Write a C++ program that fills a vector with random numbers.   (7M)

|"|'|||||"|"|||'|||

R16

SET - 4

I B. Tech II Semester Regular Examinations, April/May - 2017
OBJECT ORIENTED PROGRAMMING THROUGH C++
(Com. to CSE, IT)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

~~~~~~

PART –A

1. a) Write C++ code that reads two numbers from user and prints their sum.   (2M)
   b) List different access specifiers in C++.   (2M)
   c) Define an abstract class.   (2M)
   d) What is a pure virtual function?   (2M)
   e) List the keywords used in exception handling along with their purpose.   (2M)
   f) What is a map in STL?   (2M)
   g) What are anonymous objects in C++?   (2M)

PART –B

2. a) Present the structure of C++ program. Explain different elements in it.   (7M)
   b) Write C++ code that defines a class and declares an array of objects to that class. (7M)

3. a) Explain about default and parameterized constructors with suitable examples.   (7M)
   b) Write C++ program to add two complex numbers using friend functions.   (7M)

4. a) What are different types of inheritance supported by C++? Give an example for   (7M)
      each.
   b) Write a C++ program to overload increment operator.   (7M)

5. a) Write a C++ program to demonstrate pointers to base and derived classes.   (7M)
   b) Discuss about virtual functions with a C++ example.   (7M)

6. a) What is a template function? How to overload template functions in C++?   (7M)
   b) How to handle exceptions that arise in constructors? Explain with an example.   (7M)

7. a) Explain about different types of containers.   (7M)
   b) Write a C++ program that erases all elements in a list using iterators.   (7M)

|"|'|||||"|"|||'|||

I B. Tech II Semester Supplementary Examinations, April/May - 2017
ENGINEERING DRAWING
(Com. to CE, ME, TE)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of **Part-A** and **Part-B**
2. Answering the questions in **Part-A** is Compulsory
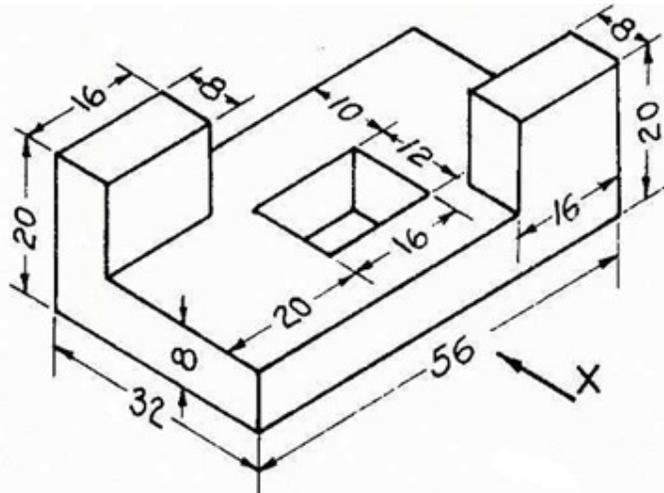3. Answer any **THREE** Questions from **Part-B**
~~~~~~

PART –A

1. a) Divide a Straight line of 80 mm into 9 equal parts.   (4M)
    b) Draw the projections of a 60mm long straight line, in the following positions   (4M)
        i) Perpendicular to the H.P, in the V.P. and its one end in the H.P.
        ii) Inclined at 45^0 to the V.P, in the H.P. and its one end in the V.P.
    c) Draw the projections of the following points on the same ground line, keeping   (4M)
        the Projectors 30mm apart.
        i) Point A, 30mm below the H.P. and in the V.P.
        ii) Point B, 35mm below the H.P. and 20mm in front of the V.P.
    d) Draw the isometric view of a square prism, with side of base 40mm and length   (4M)
        of axis 70mm, when its axis is horizontal.
    e) An isosceles triangle of base 30mm and altitude 50mm has its base in the VP.   (6M)
        The surface of the plane is inclined at 45^0 to the VP and perpendicular to HP.
        Draw its projections.

PART –B

2. a) The foci of an ellipse are 85 mm apart and the minor axis is 60 mm long.   (8M)
        Determine the length of the major axis and draw the ellipse by oblong method
        (or) rectangle method.
    b) Construct a scale to be used with a map, the scale of which is 1cm = 500m. The   (8M)
        maximum length to be read is 5km. Mark on the scale a distance of 3.85 km.

3. a) Find the distance between two points A and B when B is 40 mm in front of V.P.   (8M)
        and 25 mm above H.P. The point A is 25 mm behind the V.P. and 40 mm below
        H.P. The distance between projectors measured along xy line being 40 mm.
    b) Two pegs fixed on a wall are 4.5 m apart. The distance between the pegs   (8M)
        measured parallel to the floor is 3.6m. If one peg is 1.5 m above the floor, find
        the height of the second peg and the inclination of the line joining the two pegs,
        with the floor.

4.   The projectors through the HT and VT of a line are 100 mm apart while those   (16M)
        its ends are 65 mm apart. An end of the line is 15 mm above the HP. The HT 40
        mm in front of the VP and the VT is 75 mm above HP. Draw the front view and
        top view of the line and find its true length. Also the inclinations the line makes
        with the reference planes.

|''|'|||||''|''||'|||

5. a) A plate having shape of an isosceles triangle has base 50 mm long and altitude   (10M)
        70 mm. It is so placed that in the front view it is seen as an equilateral triangle
        of 50 mm sides one side inclined at 45^0 to xy. Draw its top view.

    b) Draw the projections of a circle of 5 cm diameter, having its plane vertical and   (6M)
        inclined at 30^0 to V.P. Its center is 3 cm above the H.P. and 4 cm in front of the
        V.P.

6. a) A hexagonal pyramid, base 25 mm side and axis 65 mm long, has an edge of its   (8M)
        base on the ground. Its axis is inclined at 30^0 to the ground and parallels to the
        V.P. Draw its projections.

    b) Draw the projections of a pentagonal prism of base 25 mm side and axis 50 mm   (8M)
        long, when it is resting on one of its rectangular faces on H.P., the axis of the
        solid is inclined at 45^0 to V.P.

7.   Draw the Front View, Top view and side view of the figure shown below. All   (16M)
        dimensions are in mm.

|"|"|||||"|"||"|||

I B. Tech II Semester Supplementary Examinations, April/May - 2017
NETWORK ANALYSIS
(Com. to ECE, EIE, ECC)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of **Part-A** and **Part-B**
2. Answering the questions in **Part-A** is Compulsory
3. Answer any **THREE** Questions from **Part-B**

~~~~~~

PART –A

1. a) What is meant by active and passive elements?   (3M)
   b) State KVL and KCL.   (3M)
   c) What is DOT convention?   (4M)
   d) Why transients occur in electric circuits?   (3M)
   e) State reciprocity theorem.   (3M)
   f) What are half power frequencies?   (3M)
   g) Define time constant of RL circuit.   (3M)

PART –B

2. a) Draw the dual of the Network shown in given below Figure 1.   (8M)
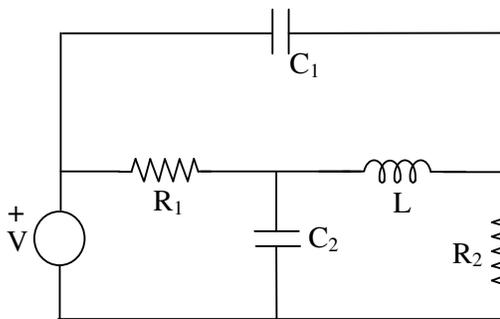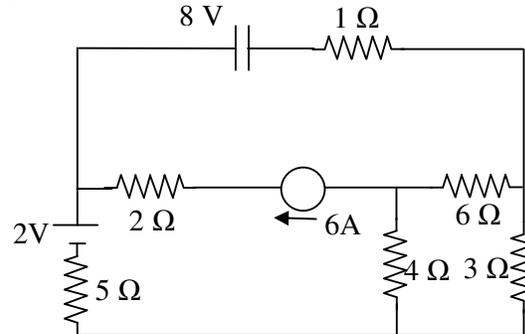
Figure 1   Figure 2

   b) Using nodal analysis, determine the Power supplied by 8V Voltage source given   (8M)
       in Figure 2.

3. a) Find the equivalent resistance between B and C in Figure 3, shown below.   (8M)
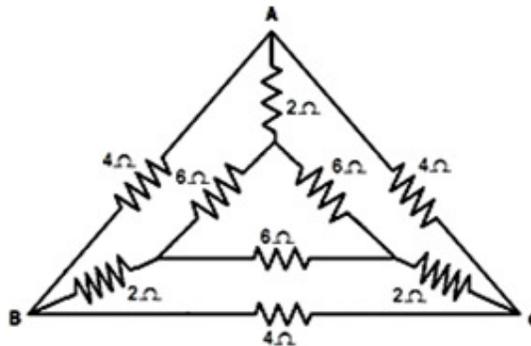
Figure.3

   b) A load consumes 100 watts at 0.8 p.f lagging. If the load voltage and current   (8M)
       phasors are expressed as follows, evaluate A and B:
       i) V=(25+jA) volts ii) I=(B+j1) Amps.

1 of 2

|"|'|||||"|"||'|||

4. a) What is mutual inductance? Derive an expression for the mutual inductance (8M) between two magnetically coupled coils having self-inductances L_1 and L_2 respectively.

b) Explain and derive the relationships for bandwidth and half power frequencies of (8M) RLC series circuit.

5. a) Determine Thevenin's equivalent across the terminals AB for the circuit shown in (8M) below Figure 4.
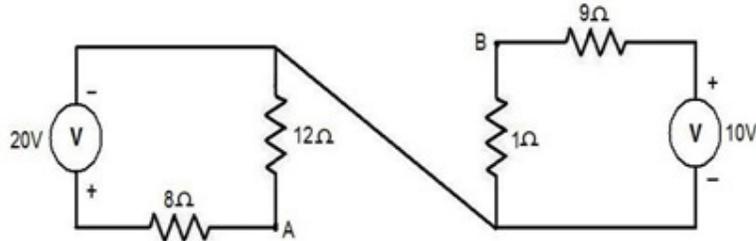

Figure.4

b) Find the current in each resistor using superposition principle for the circuit (8M) shown in Figure 5.
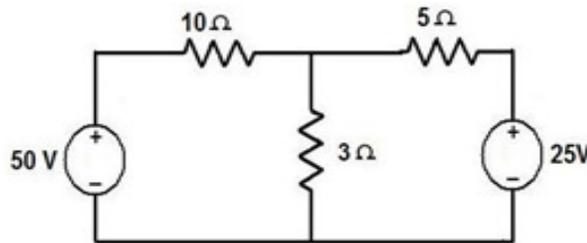
Figure.5

6. Find the Y-parameters of the network show in below Figure 6 and there by obtain (16M) Z-parameters.
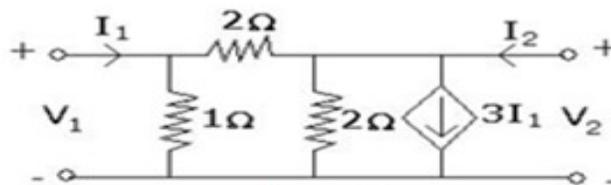
Figure.6

7. a) A Series RLC circuits has R=50 ohm, L= 0.2H, and C = 50 microfarad. Constant (8M) voltage of 100V is impressed upon the circuit at t=0. Find the expression for the transient current assuming initially relaxed conditions.

b) Determine V_C (t) and $i_L(t)$ in the circuit shown in the below Figure 7. Assume (8M) Zero initial conditions. Use Laplace Transform method
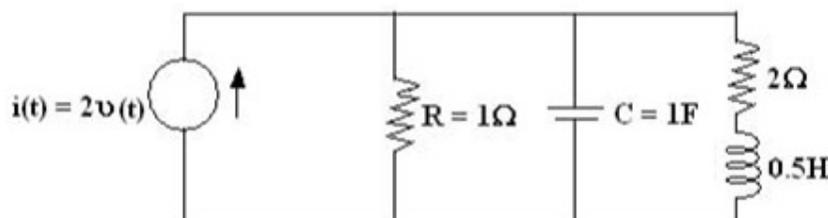

Figure.7

|"|'|||||"|"|I'|||

2 of 2

I B. Tech II Semester Supplementary Examinations, April/May - 2017
ELECTRICAL CIRCUITS ANALYSIS-I
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of **Part-A** and **Part-B**
2. Answering the questions in **Part-A** is Compulsory
3. Answer any **THREE** Questions from **Part-B**

~~~~~~

PART –A

1. a) What are linear and non-linear elements? Give an example of each. (4M)
    b) Write the expression for impedance of R-L-C series circuit. When does it have (3M)
       minimum impedance?
    c) Define Q-factor. Find the Q-factor for an inductor and capacitor. (4M)
    d) State Faraday's laws of electromagnetic induction. (3M)
    e) A connected graph has 9 branches and 4 branch currents which are independent. (4M)
       Find the number of nodes.
    f) State the limitations for Thevenin's theorem. (4M)

PART –B

2. a) Discuss the concept of source transformation technique. (8M)
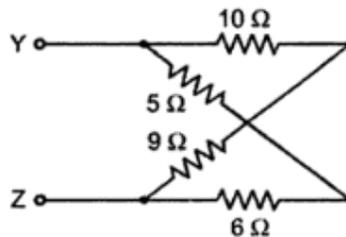   b) Find the equivalent resistance between the terminals Y and Z in Figure 1. (8M)

Figure 1

3. a) Define the following: (8M)
       i) Amplitude of an alternating quantity
       ii) Instantaneous value of an alternating quantity
       iii) Frequency
       iv) Phase
    b) Show that power consumed in a purely inductive circuit is zero when sinusoidal (8M)
       voltage is applied across it.

4. a) Prove that the locus of the current in an R-L circuit with R variable is a semicircle. (8M)
       Find the radius and the centre of the circle.
    b) A coil of inductance 0.1H and resistance of 10Ω is connected in series with a (8M)
       capacitor of 0.1μF. Find frequency of resonance of the circuit. Also find quality
       factor of the circuit at resonance.

|"|'|||||"|"||'|||

5. a) Write the procedure to analyze a parallel magnetic circuit. (8M)
   b) Describe an experiment to illustrate electromagnetic induction. (8M)

6. Explain the following terms with reference to network topology with an (16M)
   example.
   a) Twig
   b) Link
   c) Oriented graph
   d) Incident matrix

7. a) State and explain Super position theorem. (8M)
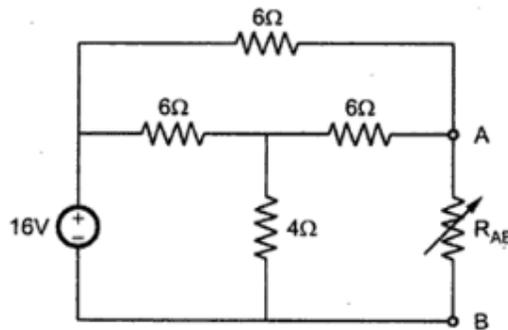   b) Find R_{AB} in Figure 2, for maximum power transfer. Also calculate maximum (8M)
   power.

Figure 2

R10

I B. Tech II Semester Supplementary Examinations, April/May - 2017
MATHEMATICAL METHODS
(Com. to ME, ECE, CHEM, IT, ECC, BME, PCE, PT, MM)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
~~~~~~~~~~~~~~~~~~~~~~~~~~

1. a) Find rank of A = $\begin{bmatrix} 2 & 1 & 3 & 1 \\ 0 & 1 & 2 & -2 \\ 4 & 0 & 2 & 6 \end{bmatrix}$ (7M)

   b) Solve by Gauss elimination method. $10x + y + z = 12$; (8M)
   $2x + 10y + z = 13$; $x + y + 5z = 70$.

2. a) Find the Eigen values and Eigen vectors of $\begin{bmatrix} 5 & -2 & 0 \\ -2 & 6 & 2 \\ 0 & 2 & 7 \end{bmatrix}$. (10M)

   b) Prove that the Eigen values of a triangular matrix are diagonal elements of the (5M)
   matrix.

3. Determine the nature of the quadratic form. Identify the nature of the quadratic (15M)
   form $x_1^2 + 4x_2^2 + x_3^2 - 4x_1x_2 + 2x_1x_3 - 4x_2x_3$.

4. a) Compute the root of the equation $x^3 - x^2 - 1 = 0$ by the method of false (8M)
   position.

   b) Find a real root of the equation $e^x = x + 2$ in the interval [1,1.4] by using (7M)
   bisection method.

5. a) Use Gauss forward interpolation formula to estimate f(3.2), given (8M)
   f(25) = 0.2707, f(30) = 0.3027, f(35) = 0.3386, f(40) = 0.3794.

   b) From the following data find the value of y at x = 2 , using Lagrange's (7M)
   interpolation formula

x	1	3	4	6
y	4	40	85	259

6. a) Find $f'(x)$ and $f''(x)$ at the point $x = 1.5$ (8M)

x	1.5	2.0	2.5	3.0	3.5	4.0
f(x)	3.375	7.0	13.625	24	38.875	59

   b) Compute the value of $\int_0^1 \frac{dx}{1+x^2}$ using trapezoidal rule and simpson's 3/8th rule. (7M)

7. a) Solve $y' = 3x + \frac{y}{2}$, $y(0) = 1$ by Taylor series method and hence find y(.1) and (7M)
   y(.2)

   b) Apply R-K Fourth order method to find y(0.25) where $y' = 1 + xy$, $y(0) = 1$ (8M)

8. a) Fit a curve $y = ax^b$ to the following data (7M)

x	5	6	7	8	9	10
y	133	55	23	7	2	2

   b) Fit a straight line of the form y = a + bx to the following data (8M)

x	1	2	4	5	6	8	9
y	2	5	7	10	12	15	19

1 of 1

R10

SET - 1

I B. Tech II Semester Supplementary Examinations, April/May - 2017
ENVIRONMENTAL STUDIES
(Com. to CE, EEE, CSE, EIE, BT, AE, AME)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
~~~~~~~~~~~~~~~~~~~~~~~~~~

1.	a)	What is the need for studying environmental issues?	(7M)
	b)	What is the scope of environmental education?	(8M)
2.	a)	Explain the methods of regeneration of the fertility of soil.	(7M)
	b)	Explain the adverse environmental impacts of modern agriculture.	(8M)
3.	a)	What is homeostasis? What are feedback mechanisms?	(8M)
	b)	Discuss the process of ecological succession.	(7M)
4.	a)	Extinction is part of the evolutionary process. Still why should we bother about the ongoing species extinction.	(8M)
	b)	Identify and explain the present day major threats to the biodiversity of India.	(7M)

5. Describe the Sources, Effects and Methods of control of the following: (15M)
   (a) Air pollution
   (b) Noise Pollution.

6.	a)	Define watershed management and explain its objectives.	(7M)
	b)	Discuss various water conservation techniques that can be practiced by individuals.	(8M)

7. Discuss in brief the following: (15M)
   (a) Human Rights
   (b) Home Sanitation
   (c) Epidemiology.

8. Prepare a report on what development you found ecological /environmental wise in a nearby village/rural area near to you in the last Five years. (15M)

|''|'|''|''|'|''|'|'|''|''|''|