

**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

**I B.TECH II SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019**Subject: EnglishBranch: **Common to CE, ME & MINING****Time: 3 hours****Max. Marks: 60****PART – A**Answer **ALL** questions of the following**5x2Marks=10 Marks**

1. Form any two words by using the following suffixes: able    b. cide
2. A) He has nearly lost his **sight**. (Write 'Homophone' of the word in bold.)  
B) He confessed his crime. (Change to 'Complex Sentence')
3. A) Use the idiom 'once in a blue moon' and frame a meaningful sentence  
B) My uncle wrote a book on zoology. ( Convert the tense to ' Present Perfect')
4. A) Delhi is the most polluted city in India. (change into positive degree)  
B) The study of sounds/phonemes in any language (write one-word substitute)
5. A) He said, "He will write the report". (Change into indirect speech)  
B) Beautiful (write antonym)

**PART-B**Answer **ALL** questions of the following**5x10 Marks= 50Marks**

1. What is Minimalism? How does it help to live a meaningful life? Discuss.

**OR**

2. Explain the importance of decision taking in his poem "Road Not Taken" by Robert Frost.
3. What are the various resources of knowledge that Abdul Kalam points out? Discuss the areas which can help us change into a knowledge society.

**OR**

4. In what way social transformation and economic generation help in developing knowledge in knowledge system. Explain
5. According to you, what advice the poem "If" gives to the present generation.

**OR**

6. Today more and more students are deciding to move to different country for their higher studies. What are the advantages and disadvantages of this trend?
7. What message can we draw from the life of Jesse Owens?

**OR**

8. Draft a letter to the Editor, The Hindu, about accidents caused by rash driving of cars and motorbikes in your town.
9. Does the poem *I, Too* by Langston Hughes talk about racial discrimination? Give your views.

**OR**

10. What are Barnum's suggestions for practicing economy? How can one achieve pecuniary independence? Elucidate.



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Time: 3 hours

Max. Marks: 60

**PART – A**Answer **ALL** questions of the following**5x2Marks=10 Marks**

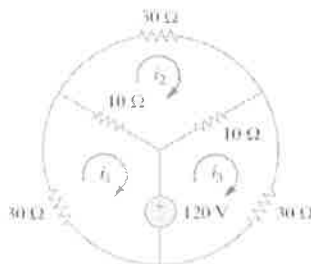
1. Define Linear and bilateral element
2. Relation between magnetic flux density (B) and magnetic field strength (H).
3. Draw impedance triangle for RL series Circuit.
4. What is the effect of temperature on the V-I characteristics of p-n junction diode.
5. What is Rectifier?

**PART-B**Answer **ALL** questions of the following**5x10 Marks= 50Marks**

1. a) State and explain Kirchoff's laws with an example.  
b) What are the limitations of the Kirchoff's laws? [7+3]

**OR**

2. Find  $i_1$ ,  $i_2$ , and  $i_3$  for the circuit shown in figure below applying mesh analysis.



3. a) Explain concept of self and mutual inductance  
b) Explain series magnetic circuit
- OR**
4. Two coils of number of turns  $N_1 = 1000$ ,  $N_2 = 400$  respectively are placed near each other. They are magnetically coupled in such a way that 75 % of flux produced by one of 1000 turns links other. A current of 6 ampere produce a flux of 0.8 mWb in  $N_1$  and same amount of current produces a flux of 0.5 mWb in the coil of  $N_2$  turns. Determine  $L_1$ ,  $L_2$ ,  $M$ ,  $K$  for coils.
  5. a) Explain steady state analysis of pure resistor with sinusoidal excitation [5+5]  
b) An ac circuit consist of pure resistance of  $10\Omega$  and is connected across an AC supply of 230V, 50hz . calculate i)currant ii)power consumed

**OR**

6. a) Explain steady state analysis of pure inductance with sinusoidal excitation [5+5]  
b) A pure inductive coil allows a currant of 10A to flow from a 230V, 50hz supply. Find i) inductive reactance ii) inductance iii) power
7. a) Explain break down mechanism in diode  
b) Write about diode resistance

**OR**

8. a) Can any ordinary rectifier diode be used as a zener diode , explain  
b) A silicon diode has a reverse saturation current of 7.12nanoA at room temperature of  $27^\circ\text{C}$ . calculate its forward current if it is forward biased with a voltage of 0.7V
9. a) Discuss about load line analysis of diode  
b) Explain Zener diode as voltage regulator

**OR**

10. a) Explain principle of operation and characteristics of LED and LCD diode  
b) Compare LED and LCD



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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**I B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: Engineering GraphicsBranch: **Common to CE, ME, CSE & MINING****Time: 3 hours****Max. Marks: 60**Answer **ALL** questions of the following**5x12Marks=60Marks**

1. Draw epicycloid of rolling circle 40mm which rolls outside another circle base circle of 150mm diameter for one revolution. Draw a tangent and normal at any point on the curve.

**OR**

2. Construct a conic, when the distance between its focus and directrix is 50 mm and its eccentricity is one also draw a normal and tangent at a point 70 mm from the focus.
3. A circular plate of negligible thickness and 50mm diameter is vertical and inclined at  $45^\circ$  to VP. Draw its projections when the centre of the circular lamina is 40mm above HP and 60mm in front of VP.

**OR**

4. The projectors of the ends of a line AB are 5 cm apart. The end A is 2 cm above the HP and 3cm in front of V.P. The end B is 1 cm below H.P. and 4 cm behind the V.P. Determine the true length, and its inclination with the two planes.
5. A hexagonal prism of base 30mm and axis 60mm rests on its base on HP with its axis perpendicular to HP and one of the base edge parallel to VP. The solid is cut by a plane which is perpendicular to VP, inclined at  $40^\circ$  to HP and bisecting the axis of the prism. Draw the front view, sectional top view and true shape of the section.

**OR**

6. A cube of side 30 mm rests on the H.P on its end with the vertical faces equally incline to the V.P. It is cut by a plane perpendicular to the V.P. and inclined at  $30^\circ$  to the H.P. meeting the axis at 25 mm above the base. Draw its front view, sectional top view and true shape of the section.
7. A pentagonal pyramid has a base side of 30mm and axis height of 70mm. It rests with its base on HP such that one of the base edges perpendicular to VP. The pyramid is cut by a plane which bisects the axis and is inclined at  $30^\circ$  to HP. Draw the development of the remaining portion of the pyramid.

**OR**

8. A cone of base diameter 40mm and altitude 60mm rests on its base on the HP. It is cut by a plane inclined at  $40^\circ$  to HP and passes through a point on axis which is 40mm above HP. Draw the development of the lateral surface of the lower portion of the cone.
9. Draw the orthographic views of the following Fig. 1

**OR**

10. Draw the orthographic projections of the object whose isometric view is shown in Fig. 2 below.

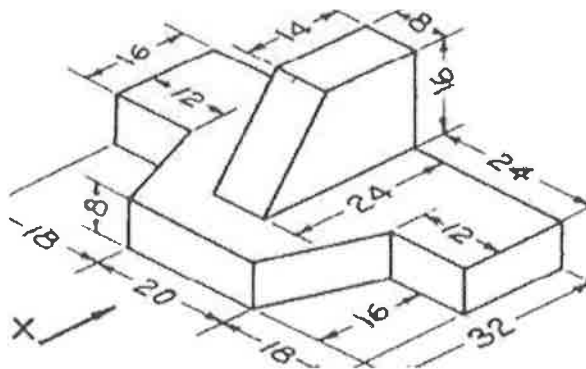


Fig. 1

Q. NO (9)

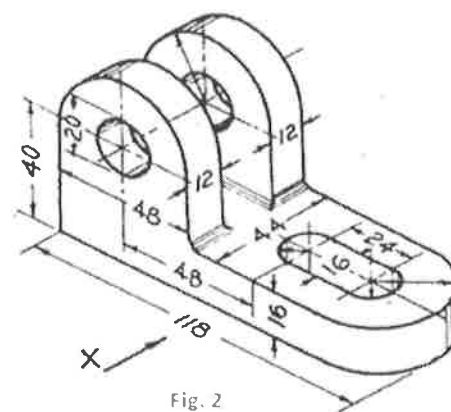


Fig. 2

Q. NO. (10)

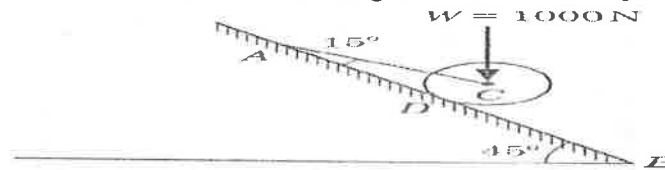


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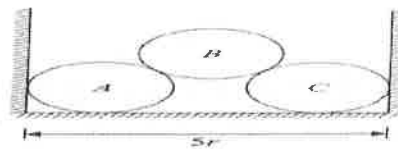
1. State the principle of transmissibility of a force.
2. Define sliding friction & rolling friction
3. Write the steps for finding moment of inertia of a composite.
4. Define the terms: Velocity and acceleration.
5. Write short notes on simple pendulum.

**PART-B**Answer **ALL** questions of the following**5x10 Marks= 50Marks**

1. a) State Varignon theorem of forces.  
b) A roller of weight  $W = 1000 \text{ N}$  rests on a smooth inclined plane. It is kept from rolling down the plane by a string AC. Find the tension in the string and reaction at the point of contact D.

**OR**

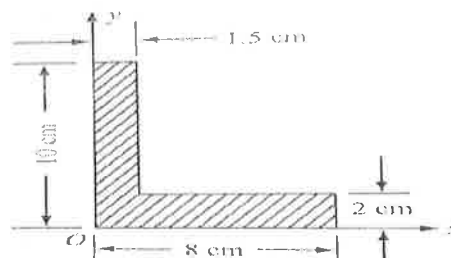
2. Three smooth cylinders, each of radius  $r$  and weight  $W$  are placed in a rectangular channel of width  $5r$  as shown in figure. Determine reactions at all contact surfaces.



3. a) Explain limiting friction  
b) A block of 200 Kg mass rest on a rough horizontal plane. Find the force required to just pull the block by an inclined force  $P$  inclined at  $30^\circ$  to the horizontal. The coefficient of static friction between the contact surfaces is 0.3.

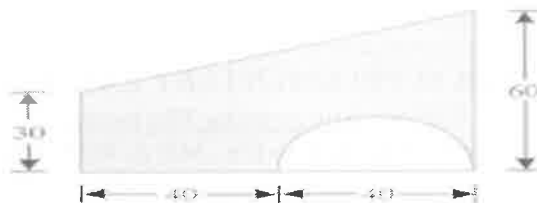
**OR**

4. Find the centroid of the L-section shown in figure.



Figure

5. Determine the moment of inertia of a semicircular area is removed from a trapezium as shown in fig.

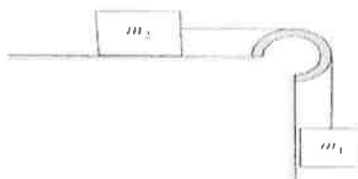


OR

6. Find the mass moment of inertia of a thin isosceles triangle plate of mass  $M$ , base  $b$  and height  $h$  about its base.
7. Describe the work of the forces acting on a rigid body. Write the principle of conservation of energy.

OR

8. A block of mass  $m_2 = 8$  kg resting on a rough horizontal plane is pulled by an inextensible string, whose other end is attached to a block of mass  $m_1 = 5$  kg and passing over a rough surface as shown in figure. Determine the acceleration of the system and the tension in each portion of the string. The coefficient of friction at all contact surfaces is 0.2.



Figure

9. A car weighs 120KN, the tractive resistance being 5N/KN. What power will be required to propel the car at a uniform speed of 20kmph?
- On level surface
  - Up an inclined of 1 in 300.
- Take efficiency of motor as 80%.

OR

10. A spring has a spring constant of 400 N/m. an object is placed against the spring when it is partly compressed, and is then released so the spring pushes it away. How much kinetic energy will the object gain as the spring goes from a compression of .80m to a compression of only .20 meters?



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Gundlupochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**I B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: **Computational Mathematics**Branch: **Common to CE, ME, ECE, EEE, CSE, IT & MINING**Time: **3 hours**Max. Marks: **60****PART – A**Answer **ALL** questions of the following**5x2Marks=10 Marks**

1. If  $f(x) = x^3 - 2x - 5 = 0$ , by the method of false position, find the fourth approximation to the required root.
2. Write Newton's forward interpolation formula.
3. Write the normal equations to fit a curve of the form  $y = ae^{bx}$
4. Write Adams-Bashforth predictor formula and corrector formula
5. What is the classification of the equation  $f_{xx} + 2f_{xy} + f_{yy} = 0$

**PART-B**Answer **ALL** questions of the following**5x10 Marks= 50Marks**

1. (a) Using Regula-Falsi method solve  $x \log_{10} x - 1.2 = 0$  correct to 3 decimal places  
(b) Establish iterative formula for finding a real root of  $x^3 - K = 0 (K > 0)$  using Newton Rapson method. Hence find  $3^{1/3}$ .

**(OR)**

2. Solve the system of equations  $4x + y + z = 4$ ,  $x + 4y - 2z = 4$ ,  $3x + 2y - 4z = 6$ , by Jacobi iterative method.
3. (a) Find  $y(25)$  using Gauss forward difference formula using the following table:

X:	20	24	28	32
Y:	24	32	35	40

- (b) By Lagrange's interpolation formula, find the value of  $x$  for which  $y$  is 0.5. The  $x$  and  $y$  are related by  $y = \frac{2}{\sqrt{\pi}} \int_0^x e^{-x^2} dx$  and  $(0.46, 0.4846555)$ ,  $(0.47, 0.4937452)$ ,  $(0.48, 0.5027498)$ ,  $(0.49, 0.5116683)$  are 4 points on the curve.

**(OR)**

4. (a) Apply Gauss forward central difference formula and estimate  $f(32)$  from the following table

x	25	30	35	40
y=f(x)	0.2707	0.3027	0.3386	0.3794

- (b) Find a parabola passing through the points  $(0, 1)$ ,  $(1, 3)$  and  $(3, 55)$  using Lagrange's interpolation formulae.

5. (a) Fit a least square geometric curve  $y=ax^b$  to the following data:

X:	1	2	3	4	5
Y:	0.5	2	4.5	8	12.5

(b) From the following table of values of x and y obtain  $\frac{d^2y}{dx^2}$  at  $x=1.2$

x	1.0	1.2	1.4	1.6	1.8	2.0	2.2
y	2.7183	3.3201	4.0552	4.9530	6.0496	7.3891	9.0250

(OR)

6. (a) Fit a least square geometric curve  $y=ae^{bx}$  to the following data:

X:	0	1	2	3
Y:	1.05	2.10	3.85	8.30

(b) From the following table of values of x and f(x) determine  $f'(0.23)$

x	0.20	0.22	0.24	0.26	0.28	0.30
f(x)	1.6596	1.6698	1.6804	1.6912	1.7024	1.7139

7. a) Given  $\frac{dy}{dx} = \frac{y-x}{y+x}$  and  $y(0) = 1$ . Compute  $y(0.1)$  in steps of 0.05 using Euler's modified method.

b) Evaluate  $y(1.1)$ ,  $y(1.2)$  using Runge-Kutta method of order four for the Initial value problem.

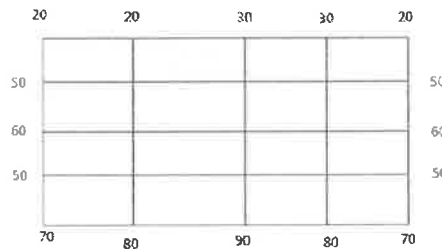
$$\frac{dy}{dx} = x^2 + y^2, y(1) = 0 \text{ with } h = 0.1.$$

(OR)

8. a) Solve the following using R - K fourth method  $y' = y - x$ ,  $y(0) = 2$ ,  $h=0.2$ . Find  $y(0.2)$ .

b) Given  $\frac{dy}{dx} = \frac{1}{1+y^2}$ ,  $y(0) = 0$ ,  $y(0.2) = 0.2027$ ,  $y(0.4) = 0.4228$ ,  $y(0.6) = 0.6841$  estimate  $y(0.8)$ ,  $y(1)$  using Milne's method.

9. Use Gauss Seidel's method to solve  $u_{xx} + u_{yy} = 0$ , for the following mesh.



(OR)

10. Solve  $\nabla^2 u = 0$  under the conditions ( $h = 1$ ,  $k = 1$ ),  $u(0,y) = 0$ ,  $u(4,y) = 12 + y$  for  $0 \leq y \leq 4$ ;  $u(x,0) = 3x$ ,  $u(x,4) = x^2$  for  $0 \leq x \leq 4$ .

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajiri (Dist), Hyderabad**I B.TECH II SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019**Subject: Data StructuresBranch: **Common to ECE, EEE, CSE & IT****Time: 3 hours****Max. Marks: 60****PART – A**Answer **ALL** questions of the following**5x2Marks=10 Marks**

1. Write an algorithm for Fibonacci sequence
2. What are the applications of singly linked list?
3. State the disadvantage of linear queue.
4. Differentiate internal node and external node.
5. List the different AVL tree rotations during insertion operation.

**PART-B**Answer **ALL** questions of the following**5x10 Marks= 50Marks**

1. a) Differentiate stack and queue data structure.  
b) Define Data structure? Discuss in brief about linear data structures with examples?
- OR**
2. a) Discuss in brief about Non linear data structures with examples?  
b) Write the disadvantages of linked list.
  3. a) Explain about the insert and delete operations in a singly linked list.  
b) Define singly linked list. Explain its node structure.
- OR**
4. Define doubly linked list? Write the C program for linked representation of Double linked list insertion and deletion operations. ?
  5. a) Differentiate between stack and Queues.  
b) Write a C program to implement queue operations using an array.
- OR**
6. a) Which of the following is essential for converting an infix to postfix form efficiently? A). An operator stack b). An operand stack c). An operand stack and operator stack d). a parse tree Justify your answer with an example?  
b) Write a C Program that reverses the contents of a queue.
  7. a) Construct a binary tree having the following traversal sequences:  
Preorder traversal: A B C D E F G H I  
Inorder traversal: B C A E D G H F I.  
b) How can a binary tree be represented using a linked list.
- OR**
8. a) Write a short note on Threaded Binary trees.  
b) What is a graph? Explain various representations of graphs.
  9. a) Build an AVL tree with the following values: {15, 20, 24, 10, 13, 7, 30, 36, 25, 42, 29}  
b) Construct a splay tree for the following values 6, 2, 5, 9, 12, 10, 4.
- OR**
10. a) Define binary search tree. Construct the binary search Tree for the below-given data. P, F, B, H, G, S, R, Y, T, W, Z.  
b) State the properties of Red-Black trees with an example.



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1. What is displacement current?
2. Define dielectric constant and mention its unit(s).
3. What is population inversion and pumping?
4. Write any two conclusions of Kronig - Penny model
5. What is the temperature effect on concentration of charge carriers in intrinsic semiconductors

**PART-B**Answer **ALL** questions of the following**5x10 Marks= 50Marks**

1. a) What is induced emf? Derive expression for emf in a conductor. [7 M]  
b) Distinguish between vector and scalar fields? Give one example of each of them. [3 M]
- (OR)
2. a) Write Maxwell's equations in differential form [5M]  
b) Explain Gauss law in electrostatics [5M]
  3. a) Derive the relation between D,P and E.  
b) A charge of  $2 \times 10^{-10}$  C is to be stored on each plate of a parallel plate capacitor having an area of  $650 \text{mm}^2$  & plate separation 4mm, what voltage is required if a material having an  $\epsilon_r=3.5$  is positioned within the plates.
- (OR)
4. Explain different types of electrical polarization mechanisms & derive the expressions for polarizabilities
  5. a) What are fiber-bending losses? [4M]  
b) Explain the applications of optical fibers in communication. [4M]  
c) A signal of 100mW is injected into a fiber. The out coming signal from the other end is 40mW. What is the loss in dB? [2M]
- (OR)
6. a) Write a note on principle of an optical fiber. [3M]  
b) What are the advantages of optical fibers over co-axial cables. [4M]  
c) Calculate the Numerical Aperture and acceptance angle for an optical fiber with core and Cladding refractive indices being 1.48 and 1.45 respectively? [3M]
  7. a) Sketch and explain the periodic potential of an electron moving in a one dimensional lattice. Identify the potential in various regions. [6M]  
b) Discuss the formations of energy band structures in solids using energy versus inter-atomic distance curve. [4M]
- (OR)
8. a) Briefly explain the band theory of solids. How does the band theory differ from the classical free electron model in explaining the properties of metals? [6M]  
b) Mention the drawbacks of quantum free electron theory. [4M]
  9. a) Explain different types of semiconductors in detail with necessary bond and band diagrams. [6M]  
b) (i) In your own words, explain how donor impurities in semiconductors give rise to excess free electrons in numbers compared to those generated due to valence band to conduction band excitations. (ii) Also explain how acceptor impurities give rise to excess holes compared to those generated due to valence band to conduction band excitations. [4M]
- (OR)
10. a) Derive the expression for the continuity equation [7M]  
b) Mention the applications of Hall Effect. [3M]



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1. What are superconductors? Give one example.
2. Define dipole moment. Is it a vector or scalar quantity?
3. Write the characteristics of a LASER beam.
4. Mention two uses of ultrasonic waves?
5. What is eddy current?

**PART-B**Answer **ALL** questions of the following**5x10 Marks= 50Marks**

1. a) A paramagnetic material has a magnetic field intensity of  $10^4$  Ampere/meter. If the susceptibility of the material at room temperature is  $3.7 \times 10^{-3}$ , calculate the magnetization and flux density in the material? [4M]  
b) Write properties of diamagnetic substances? [6M]
- (OR)**
2. a) Write properties of paramagnetic substances? [5M]  
b) Explain the influence of external magnetic field on the magnetic dipoles in para and dia magnetic substances. [5M]
3. a) Write a short note on Barium titanate? [5M]  
b) Draw the neat sketch and also explain the hysteresis curve of ferro electrics? [5M]
- (OR)**
4. a) Explain the orientation polarization. [4M]  
b) Explain the concept of internal field in solids. [6M]
5. a) Explain Nd:YAG laser? [7M]  
b) Explain stimulated emission of radiation. [3M]
- (OR)**
6. a) What is total internal reflection? Explain how it is used in fibre optic communications. [6M]  
b) Calculate the numerical aperture and hence acceptance angle for an optical fiber whose core and cladding has refractive index of 1.59 and 1.40 respectively. [4M]
7. a) Obtain the equation for absorption coefficient? [5M]  
b) Explain Sabine's formula? [5M]
- (OR)**
8. a) Write the basic requirements of acoustically good hall. [4M]  
b) How echelon effect, resonance and noise affect the architectural acoustics and write their remedies. [6M]
9. a) What is the principle of radiographic testing. [5M]  
b) Give the advantages of ultrasonic testing. [5M]
- (OR)**
10. a) Differentiate between cracking, spalling and staining.  
b) Mention the principle of X-ray radiography and describe the procedure of this testing.





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**I B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: Applied ChemistryBranch: **Common to EEE, ECE, CSE & IT****Time: 3 hours****Max. Marks: 60****PART – A**Answer **ALL** questions of the following**5x2Marks=10 Marks**

1. Why does hard water consume lot of soap?
2. How do anodic and cathodic area affect rate of corrosion?
3. Why does natural rubber need compounding?
4. Define combustion.
5. What are composites?

**PART-B**Answer **ALL** questions of the following**5x10 Marks= 50Marks**

1. Explain the softening of hard water by cold lime-soda process with neat diagram & mention its limitations.

**OR**

2. What is hardness of water? How do you express hardness? Give its various units & their inter conversions.
3. a) Explain the construction & working of calomel electrode.  
b) Write the differences between primary and secondary cells.

**OR**

4. Explain Dry (chemical) theory of corrosion in detail.
5. a) Bring out the differences between thermoplastics and thermosetting plastics.  
b) Write the preparation, properties and engineering applications of Bakelite.

**OR**

6. a) Give an account on the significance of biodegradable polymers.  
b) What are the functions of plasticizers and reinforcing agents during the compounding?
7. a) Explain proximate analysis of coal in detail.  
b) Write the significance of proximate analysis.

**OR**

8. a) Define cracking. How is it useful?  
b) Explain fixed bed catalytic cracking with neat diagram.
9. a) Explain ultrasonic and microwave assisted reactions with suitable examples.  
b) Discuss the concept of R<sub>4</sub>M<sub>4</sub> with special reference to Econoburette and survismeter.

**OR**

10. a) What do you mean by green chemistry? Mention its principles.  
b) Explain the concept of R<sub>4</sub>M<sub>4</sub> with reference to econoburette.

