

Code No: R18A0201

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, February 2021

Basic Electrical Engineering

(EEE, ECE, CSE & IT)

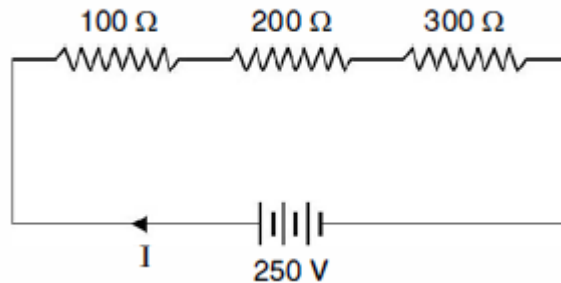
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Time: 2 hours 30 min

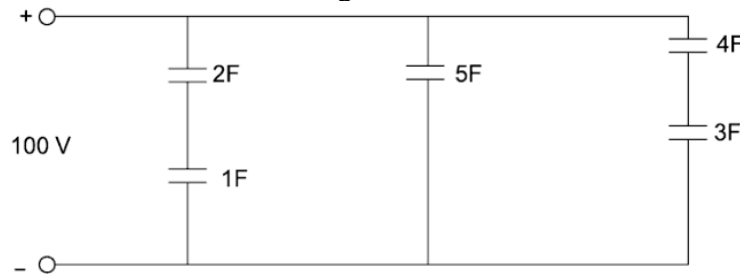
Max. Marks: 70

Answer Any **Five** Questions
All Questions carries equal marks.

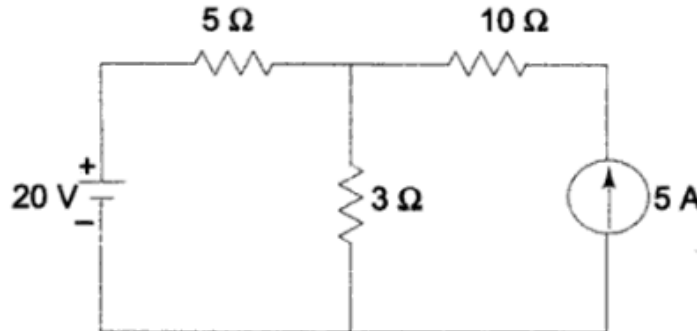
- 1(a)** Illustrate KVL & KCL with an example. [7M]
- (b)** Three resistances $100\ \Omega$, $200\ \Omega$ and $300\ \Omega$ are connected in series to a 250 volt supply. Determine the total resistance, current in the circuit and the power dissipated in each resistor. [7M]



- 2(a)** Summarize the active and passive elements with an example. [7M]
- (b)** Find the total equivalent capacitance and total energy stored if the applied voltage is 100V for the circuit shown in the fig. [7M]

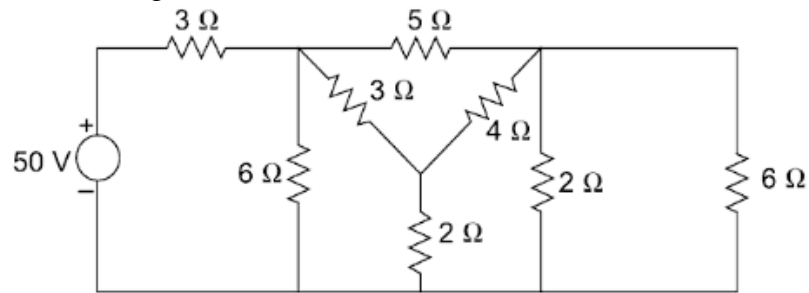


- 3(a)** Find the current through $3\ \Omega$ resistor using superposition theorem in the circuit [7M]



- (b)** Discuss the steps to determine the Norton's equivalent circuit. [7M]

- 4(a) Illustrate the source transformation technique with an example. [7M]
- (b) Using star- delta transformation, determine the current drawn by the source in the circuit shown in the fig. [7M]



- 5(a) Illustrate the crest factor and form factor of a sine-wave. [7M]
- (b) An AC circuit consists of a pure resistance of 10Ω and is connected across an AC supply of 230V, 50Hz. Calculate (i) Current (ii) Power consumed (iii) Power factor (iv) write down the equations for voltage and current. [7M]
- 6 Find the average value and rms value of the sinusoidal waveform. [14M]
- 7(a) Describe the Faraday's law of electro-magnetic induction principle. [7M]
- (b) Discuss the elementary concept of a generator. [7M]
- 8(a) Illustrate the operation of Earth Leakage Circuit Breaker (ELCB) [7M]
- (b) Discuss the importance of earthing. [7M]

Code No: **R18A0013****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, February 2021**Engineering Chemistry****(EEE, ECE, CSE & IT)**

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Time: 2 hours 30 min**Max. Marks: 70**Answer Any **Five** Questions

All Questions carries equal marks.

- 1 a) What is meant by EMF of a Cell? Write its applications. [3M]
 b) Define a secondary cell. Explain the construction and working of lithium ion battery with cell reactions. [7M]
 c) Define corrosion. What are the causes and effects of corrosion? [4M]
- 2 a) What are fuel cells? Explain the construction and working of H₂-O₂ cell. [7M]
 b) What is cathodic protection? Explain impressed current cathode method. [7M]
- 3 a) Show through a diagram, explain the splitting of d-orbitals tetradral complexes. [7M]
 b) Explain about Linear Combination of Atomic Orbitals. [7M]
- 4 a) State salient features of CFT . [4M]
 b) What are the postulates of molecular orbital theory? Explain molecular energy level diagrams for N₂ molecule with the neat diagram? [10M]
- 5 a) How can you estimate hardness of water by EDTA method? Explain the EDTA titration with its advantages. [10M]
 b) Explain briefly about disinfection of water by ozonisation. [4M]
- 6 a) What is portable water? Explain the specifications of portable water. [4M]
 b) Explain the desalination of hard water by reverse osmosis water with neat diagram. [6M]
 c) What are ion exchange resins? How is the exhausted resin regenerated in ion exchange method of water softening? [4M]
- 7 a) What is Anti-Markovnikov's addition? Explain briefly with suitable example. [6M]
 b) What are reduction reactions? Explain briefly reduction of carbonyl compounds using NaBH₄. [6M]
 c) Define electrophilic addition reaction. [2M]
- 8 a) Define octane and cetane number? Give their significance? [4M]
 b) Describe a method of fluid bed catalytic cracking with neat sketch and discuss the advantages of catalytic cracking. [10M]

Code No: **R18A0301****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, February 2021**Engineering Graphics****(ME & AE)**

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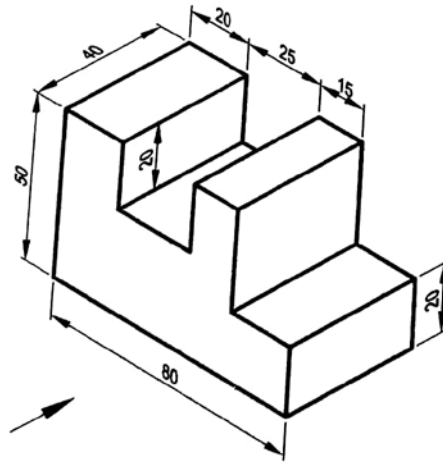
Time: 2 hours 30 min**Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.

- 1 Draw a hyperbola when the distance of its focus from its directrix is 50mm and eccentricity is $3/2$. Also draw a normal and tangent to the hyperbola at a point 25mm from the directrix [14M]
- 2 Draw an epicycloid of a circle of diameter 50mm, which rolls outside a circle of diameter 180mm for one revolution. [14M]
- 3 A 100 mm long line PQ has its end P 10 mm above the H.P. and 70 mm in front of the V.P. The line is inclined at 60^0 to the H.P. and 30^0 to the V.P. Draw its projections. [14M]
- 4 A 75 mm long line PQ is inclined at 30^0 to the H.P. Its end P is 20 mm above the H.P. and on the V.P. End Q is 60 mm in front of the V.P. Draw the projections of a line. [14M]
- 5 The diagonals of a rhombus measures 100 mm and 40mm. The longer diagonal is inclined at 30^0 to the H.P. with an end in H.P. and the smaller diagonal is parallel to both the principal planes. Draw its projections. [14M]
- 6 A hexagonal pyramid of base edge 30 mm and axis 60 mm, has a triangular face on the ground and the axis parallel to the V.P. Draw its projections. [14M]
- 7 Draw an isometric projection of a pentagonal prism of base side 35mm and axis 60mm. The prism rests on its base on the H.P. with an edge of the base parallel to the V.P. [14M]

- 8 Draw Three view of object shown in Fig.
All dimensions are in mm

[14M]



Code No: R18A0002

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, February 2021**Professional English****(Common to all branches)**

Roll No									
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Time: 2 hours 30 min**Max. Marks: 70**Answer Any **Five** Questions

All Questions carries equal marks.

- 1 a.** Describe a person whom you like the most. [7M]
b. Describe your favorite smart phone. [7M]
- 2** What are the features of a good paragraph? Write a paragraph on ‘The importance of Good Manners’ by following the conventions of writing a paragraph. [14M]
- 3.a** Explain briefly about the effectiveness of good *eye contact, gestures, physical appearance* and *voice modulation* for an effective oral presentation. [4M]
- b** Fill in the blanks in the text below with one of the following idioms: [10M]
- over the moon
 - a drop in the ocean
 - actions speak louder than words
 - have a mountain to climb
 - an arm and a leg
 - a blessing in disguise
 - a piece of cake
 - once in a blue moon
 - jumping the gun
 - it’s a small world
- I. Overcoming this problem is an easy task. We _____ in front of us.
- II. Five hundred may seem like _____ but if everyone contributed that much we’d have seventy thousand.
- III. Getting my bike fixed is going to cost her _____ as the engine has completely blown, but she has no choice. She needs it for work.
- IV. The infection he had a few days ago which prevented him from going on holiday with his friends was _____. They had a terrible time. Everything went wrong and it cost them a lot of money.
- V. The interview for that new job was _____. They asked me very easy questions.
- VI. The new Raj Mauli Scorsese film is out at the cinema. A film that comes out that I really enjoy and want to see happens _____, so I’ll definitely go and see it.
- VII. Shabana was _____ when she gave up his job to start university. Now she has found out she can’t get a grant.
- VIII. Mohan is finally getting a chance to go on her trip of a lifetime, a holiday to

- Italy! He was _____ when I spoke to him.
- IX. The government keeps talking about reducing poverty. However, what do they ever do about it? Nothing! _____.
- X. Hari was in a café in America and amazingly, he saw Sandhya from down the road in there _____.
- 4.a** Change the following passive sentences into active sentences. **[7M]**
- a. This novel was written by Tara.
 - b. The project will be discussed tomorrow.
 - c. The engineer has announced his plan to build a bridge over the river.
 - d. She was present a gift.
 - e. He gave me a pen.
 - f. The results have not been announced yet.
 - g. She was told to get out.
- 4.b** Change the following active sentences into passive sentences. **[7M]**
- h. The girl killed the cat.
 - i. He loves her.
 - j. I brought a bike yesterday.
 - k. I gave an apple.
 - l. They have invited all of my teachers.
 - m. He is reading a book.
 - n. Sandhya will give you a speech.
- 5** Explain the importance of the following aspects with regard to a good interview: **[14M]**
- a. Eye contact
 - b. Smile
 - c. Physical appearance
 - d. Gestures
 - e. Postures
 - f. Spoken English
 - g. Self-introduction
- 6.a** What is a cover letter and what is its purpose? Explain some Dos and Don'ts in writing a cover letter. **[7M]**
- b** Change the following sentences from direct to indirect speech. **[7M]**
- a. David said to me, "I am having my lunch."
 - b. Radha said to Malathi, "I am very busy now."
 - c. He said to Krishna, "I am unwell."
 - d. She said to her teacher, "I finished my homework two days ago."
 - e. Chaitanya said to his mom, "I want to go to a park."
 - f. She said to her classmate, "I am attending a seminar tonight."
 - g. Mustafa said to Emily, "My sister writes well."
- 7** **Prepare an effective resume for the following notification.** **[14M]**

RECRUITMENT

Date of notification _____ (your choice)

Name of the newspaper _____ (your choice)

Name of the company _____ (your choice)

For the position of _____ (your choice)

With/without experience.

Qualification: B.Tech with excellent academic record (Imagine that you have the

8.a Rewrite the following sentences correctly.

[7M]

- a. The capital of the United Kingdom is the London.
- b. Where you are going?
- c. I must to call her immediately.
- d. According to me, that is a good decision.
- e. I don't know where is my friend?
- f. Murali has got a project a week ago.
- g. kalam explained her the problem twice.

b In each of the following questions, there is a certain relationship between two words given on one side; and one word is given on the other side followed by a blank. Fill in the blank choosing one the given alternatives having the same relationship with this word as the words of the given pair have. [7M]

I. Eye : Myopia :: Teeth : _____

- a. Trachoma
- b. Eczema
- c. Pyorrhoea
- d. Cataract

II. Antiseptic : Germs :: Antidote : _____

- a. Wound
- b. Infection
- c. Allergy
- d. Poison

III. Election : Manifesto :: Meeting : _____

- a. Preface
- b. Cart
- c. Circular
- d. Agenda

IV. Squint : Eye :: Squeeze : _____

- a. Throat
- b. Hand
- c. Tongue
- d. Cloth

V. Coal : Heat :: Wax : _____

- a. Light
- b. Bee
- c. Energy
- d. Candle

VI. Traveller _____ : Journey :: Sailor :

- a. Voyage
- b. Ship
- c. Crew
- d. Water

VII. Carpenter : Saw :: Tailor:_____

- a. Cloth
- b. Needle
- c. Measurement
- d. Sewing

Code No: **R18A0015****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B I B.Tech II Semester Supplementary Examinations, February 2021**Engineering Physics****(ME & AE)**

Roll No									

Time: 2 hours 30 min**Max. Marks: 70**Answer Any **Five** Questions

All Questions carries equal marks.

- 1 a) Derive an equation for motion of forced damped harmonic oscillator. [8M+6M]
b) What are the characteristics of simple harmonic oscillator
- 2 a) What is Quality factor? Explain in detail [7M+7M]
b) Explain the Phasor model of SHM.
- 3 a) Derive an equation of interference in thin films due to reflection. [6M+4M+4M]
b) What are the conditions for superposition of waves to produce interference
c) Distinguish between division of wave front and division of amplitude.
- 4 a) With neat diagram explain construction and working principle of Michelson [10M+4M] interferometer.
b) Calculate the aperture of the objective of a telescope which may be used to resolve two stars separated by 4.88×10^{-6} radians for light of wavelength 6000 \AA .
- 5 a) Describe classification of materials based on band theory of solids [10M+4M]
b) Draw and explain E-K diagram.
- 6 a) What are the postulates of free electron theory? List out the draw backs of free electron [9M+5M] theory.
b) Explain Bloch theorem.
- 7 a) Distinguish between dia, para and ferromagnetic materials. [10M+4M]
b) If NaCl crystal is subjected to an electric field of 500 V/m and the resulting polarization is $2.3 \times 10^{-8} \text{ C/m}^2$, calculate the relative permittivity of NaCl.
- 8 a) Explain working Principle of Ruby laser. [8M+6M]
b) What are the applications of lasers?

Code No: **R18A0022**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, February 2021

Mathematics-II

(Common to all branches)

Roll No									
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Time: 2 hours 30 min

Max. Marks: 70

Answer Any **Five** Questions

All Questions carries equal marks.

- 1** a) The equation $2x = \log_{10}(x) + 7$ has a root between 3 and 4. Find this root, correct to three decimal places, by false position method **[7M]**
- b) Find a real root of the equation $f(x) = x^3 - 4x - 9 = 0$ using bisection method correct to two decimal places **[7M]**
- 2** a) Using Newton- Raphson method, Find the square root of 24 **[7M]**
- b) The table below gives the values of $\tan x$ for $0.10 \leq x \leq 0.30$ **[7M]**

x	0.10	0.15	0.20	0.25	0.30
$y = \tan x$	0.1003	0.1511	0.2027	0.2553	0.3093

Find $\tan 0.12$

- 3** a) Derive normal equations of a straight line **[7M]**
- b) Using Taylor's series method, find y for $x = 0.1$ given that **[7M]**

$$\frac{dy}{dx} = x^2 - y, y(0) = 1$$

- 4** Evaluate $\int_0^{\pi} \sin x \, dx$ by dividing the range into 10 equal parts using **[14M]**

i. Trapezoidal rule

ii. Simpson's $\frac{1}{3}$ rule

- 5** a) Show that $\beta(m, n) = \int_0^1 \frac{x^{m-1} + x^{n-1}}{(1+x)^{m+n}} dx$ **[7M]**

b) Show that $\int_0^{\frac{\pi}{2}} \sqrt{\cot \theta} \, d\theta = \frac{1}{2} \Gamma\left(\frac{1}{4}\right) \Gamma\left(\frac{3}{4}\right)$ **[7M]**

- 6** a) Show that $\beta(m, n) = \frac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}$ **[8M]**

b) Evaluate $\int_0^1 \frac{dx}{\sqrt{1-x^4}}$ **[6M]**

- 7** a) Evaluate $\iint r^3 dr \, d\theta$ over the area included between the circles $r = 2 \sin \theta$ and $r = 4 \sin \theta$ **[7M]**

- 8**
- b) Find the volume of the ellipsoid $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$ [7M]
- a) Show that $\vec{F} = (y^2 - z^2 + 3yz - 2x)\hat{i} + (3xz + 2xy)\hat{j} + (3xy - 2xz + 2z)\hat{k}$ is both solenoidal and irrotational [7M]
- b) Find the total work done in moving a particle in a force field given by $\vec{F} = 3xy\hat{i} - 5z\hat{j} + 10x\hat{k}$ along the curve $x = t^2 + 1$, $y = 2t^2$, $z = t^3$ from $t = 1$ to $t = 2$ [7M]

Code No: **R18A0502****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Supplementary Examinations, February 2021**Object Oriented Programming**

(Common to all branches)

Roll No										
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Time: 2 hours 30 min**Max. Marks: 70**Answer Any **Five** Questions

All Questions carries equal marks.

- 1 a) Describe the object oriented paradigm in C++? [7M]
b) Define data encapsulation? How will you achieve data hiding using encapsulation? [7M]
- 2 a) Demonstrate the benefits of OOP? [6M]
b) List and discuss various control structures and loops in C++? [8M]
- 3 a) Distinguish static-binding and Late-binding in C++? [7M]
b) Demonstrate friend functions in C++ with suitable example? [7M]
- 4 a) What is inline function? How will you differentiate function and inline function? [5M]
b) What is abstract class? How is it useful in developing applications in C++? Discuss with an example. [9M]
- 5 What is constructor and destructor? Explain clearly multiple constructors in a class with suitable example. [14M]
- 6 Define inheritance? Explain about single inheritance and multiple inheritance in object oriented design process. [14M]
- 7 What do you mean by overloading in C++? Explain function overloading and operator overloading with a suitable example. [14M]
- 8 Define a class template? Explain class templates with multiple parameters in C++. [14M]
