Code No: R18A0002

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Regular Examinations, April/May 2019

Professional English

(Cor	nmo	n to	all	b	ranc	ches)

Roll No						

Time: 3 hours

Max. Marks: 70

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1 .Bill Gates hopes to solve some of the world's biggest problems using a new kind of philanthropy. Discuss his approach to put an end to these problems. **[14M]**

OR

2.a) Complete the sentences by choosing the appropriate non-finite verb. [7M]

1. The police constable saw a thief _____ on a bicycle.

a. escaping b. escape c. to escape d. escaped

2. I tried ______ a stain left by coffee from my shirt using the new cleaning agent."

a. clean b. to clean c. to cleaning d. to cleaned

3. We can hear the class choir _____ in the hall.

a. to practice b. practiced c. practicing d. to practices

4. _____ a loud sound, the students rushed out of the auditorium."

a. hearing b. hear c. to hear d. heard

5. I watched the mild scolding with a _____ frown.

a. to worry b. worry c. worried d. worries

6. _____ faster is dangerous for kids.

a. to go b. to going c. going d. go

7. ______ is good for mind.

a. to read b. to reading c. read d. reading

b) Describe the process of creating an email id or composing an official email. [7M]

SECTION-II

3. a)Rewrite the sentences as directed. [7M]

i. He plays tennis as well as football. (begin with 'not only...)

ii. This razor is not as sharp as that one. (into comparative degree)

iii. Very few cities in India are as rich as Mumbai. (into superlative degree)

iv. Caesar was stabbed by Brutus. (into active voice)

v. The audience loudly cheered the Mayor's speech. (into passive)

vi. Despite the bad weather, we had a good time. (begin with although)

vii. 'I'm sorry I lost your book, Leo', said Michael.(Begin with 'Michael apologised...')

b) Write the meanings for the following idioms with an example sentence for each.[7M]

i. a blessing in disguiseiii. a piece of cakev. jumping the gunvii. over the moon

ii a drop in the ocean iv. an arm and a leg vi. once in a blue moon **R18**

OR

4.a)What is 'an abstract'? What purpose does it serve in an essay/a paper? [7M]

b) Discuss some body language features important for making an oral presentation. [7M]

SECTION-III

5. Write a cover letter applying for the position of a 'Junior Programmer' assuming that you are a fresh B.Tech. graduate. Use 'Full Block Format' for the letter. [14M]

OR

- 6.a) Convert the following sentences as directed. [7M]
 - i. He said to me, "I expect you to attend the function." (into indirect speech)
 - ii. John asked, "How long will it take to travel from Germany to South Africa?" (into indirect speech)
 - iii. The father warned his son that he should be beware of him. (into direct speech)
 - iv. Raj said, "I'm teaching English online" (into indirect speech)
 - v. He swore in the name of God that he was ignorant of the matter. (into indirect speech)
 - vi. John's father reminded him to take his umbrella. (into direct speech)
 - vii. The teacher warned the students that anger is like an acid. (into direct speech)
- b) Discuss in detail some of the positive body language features specific to job interviews. [7M]

SECTION-IV

7. Compose your resume in the latest format assuming that you are a fresh B.Tech. graduate. [14M]

OR

- 8.a) Attending a telephonic interview can be more challenging than attending a face-to-face interview. Do you agree? Justify. [7M]
 - b) Complete each sentence with the correct auxiliary verb choosing from the list below. [7M]

have has do does

i.What _____ you done?

ii._____ she know that you are here?

iii.The lesson _____not started yet.

iv.____you drink milk?

v.Who _____ eaten my biscuits?

vi.It _____ not matter.

vii.We _____ not seen you for a long time.

SECTION-V

9. You are a member of the committee appointed to find out the reasons for the sudden fall in the class X results of the government schools of a village. Write a report on your findings making suitable suggestions/recommendations to overcome the situation. **[14M]**

OR

10.a)What do you understand by 'professional etiquette'? How is it relevant for a working professional? **[7M]**

- b) Correct the following sentences and rewrite . [7M]
 - i. I have visited Niagara Falls last weekend.
 - ii. Although it was raining, but we continued working.
 - iii. She can be able to drive.
 - iv. When I will finish my work, I will call you.
 - v. Please explain me how to improve my confidence.
 - vi. Can you give me information?
 - vii. You speak English good.

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Regular Examinations, April/May 2019

Mathematics-II

(Common to all branches)



Time: 3 hours

3

Max. Marks: 70

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1 (a).For x=0,1,2,3,4, f(x)=1,14,15,5,6. Find the value of f(3) using Forward [7M] difference table.

(b).Find the polynomial which fits the data in the following table using Gauss forward formula.

Х	3	5	7	9	11	
У	6	24	58	108	174	[7M]

OR

2 (a). Find the positive root of $x^3 - x - 1 = 0$ correct to two decimal places by [7M] bisection method.

(b). Using Newton Rapson method, find the root of the equation $f(x) = e^x - 3x$ that lies between 0 and 1.

[7M]

[9M]

SECTION-II

(a). Evaluate $\int_{0}^{1} \frac{1}{1+x} dx$, using (i) Trapezoidal rule,

(ii) Simpsons 1/3 and 3/8 rule.

(b). Fit a straight line to the following data

x 0 1 2 3 4	<u>,</u> ,	<u> </u>		<u> </u>		
	X	0	1	2	3	4

у	1	1.8	3.3	4.5	6.3	
By the m	ethod of lea	st squares.				[=== 4]
						[51/1]
			OR			
-	y By the m	y 1 By the method of lea	y 1 1.8 By the method of least squares.	y 1 1.8 3.3 By the method of least squares.	y 1 1.8 3.3 4.5 By the method of least squares. OR	y 1 1.8 3.3 4.5 6.3 By the method of least squares. OR

4 (a). Solve $y^1 = x - y$ given that y(1)=0.4. Find y(1.2) using RK method. [8M]

(b). Fit a straight line to the form y=a+bx for the following data

x	0	5	10	15	20	25	[6M]
У	12	15	17	22	24	30	

SECTION-III

5

(a). To show
$$B(m,n) = \int_{0}^{\infty} \frac{x^{m-1}}{(1+x)^{m+n}} dx$$
.

(b). Show that
$$\Gamma(n) = \int_{0}^{1} (\log \frac{1}{x})^{n-1} dx, n > 0.$$

[7M]

[7M]

6 (a).Evaluate (i)
$$\int_{0}^{\infty} x^{6} e^{-2x} dx$$
, (ii) $\int_{0}^{\infty} e^{-4x} x^{3/2} dx$. [6M]

OR

(b). Prove that
$$B(m,n) = \frac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}$$
, where $m, n > 0$.

[8M]

SECTION-IV

7 (a). Evaluate
$$\int_{0}^{4} \int_{y^{2}/4}^{y} \frac{y}{x^{2} + y^{2}} dx dy.$$
 [7M]

(b). Evaluate $\iint_{R} y \, dx dy$, where R is the domain bounded by Y-axis, the curve [7M] $y = x^2$ and the line x+y=2 in the first quadrant. (a).By changing in to polar coordinates evaluate $\int \int \frac{x^2 y^2}{x^2 + y^2} dx dy$ over the annular region between the circles $x^2 + y^2 = a^2$ and $x^2 + y^2 = b^2$. (b>a) [7M]

(b).Evaluate $\iiint (xy + yz + zx) dx dy dz$, where V is the region of space bounded by x=0,x=1,y=0,y=2,z=0,z=3.

[7M]

SECTION-V

9 (a).Find the directional derivative of $xyz^2 + xz$ at(1,1,1) in the direction of the [7M]

normal to the surface $3xy^2 + y = z$ at (0,1,1).

8

(b). Find the work done in moving a particle in the force filed

[7M]
$$F = 3x^{2}i + (2xz - y)j + zk \text{ along the straight line from (0,0,0) to (2,1,3).}$$

OR

10 Verify Stokes theorem for $F = (x^2 + y^2)i - 2xyj$ taken round the rectangle bounded by **[14M]** the lines $x = \pm a$, y = 0, y = b.

(Autonomous Institution – UGC, Govt. of India)

I B. Tech II Semester Regular Examinations, April/May 2019

Engineering Physics

(ME & AE)

Roll No							
				N	lax. I	Mark	s: 70

Time: 3 hours

3

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1	a) Define a damped harmonic oscillator and deduce an equation of motion.	[6M]
	b) Explain the effect of damping on the frequency and amplitude of the damped	
	harmonic oscillator.	[8M]

OR

2	a) Giving the Forced Oscillator solution, explain different frequency conditions.	[8M]
	b) Explain energy decay in damped harmonic oscillator.	
		[6M]

SECTION-II

a) Differentiate between interference and diffraction of light. [4M]
b) Explain the phenomenon of Fraunhofer diffraction of light through single slit and derive the expression for intensity maxima and minima. [10M]

OR

- a) Explain the phenomenon of division of wave front and deduce the expressions [10M] for maxima and minima of light reflected from a thin parallel film.
 - b) In a Newton's rings setup with air the diameter of the 3rd ring and the 20th ring are 0.2cm and 0.7 cm respectively. If the radius of curvature is 100cm find the wave length of the light used.

SECTION-III

5

7

10

a)	What are the assumptions and conclusions of Free electron theory of metals.									[6M]			
b)	Explain	the	motion	of	electron	in	а	periodic	potential	and	give	the	
	consequences of Kronig-Penny model.												

[8M]

OR

6	a)	Explain the terms Fermi level and effective mass.	[6M]
	b)	Derive an expression for density of states.	
			[8M]

SECTION-IV

a)	Explain the terms electronic and ionic polarizabilities and derive an expression	[10M]
	for electronic polarizability.	
b)	For helium gas with radius 51pm and density 0.17kg/Cubic meter find the dielectric constant	
		[4M]

OR

8	a) b)	What is Hysteresis, and explain Hysteresis curve based on domain theory. Distinguish Hard and soft magnetic materials and give examples and applications of them.	[8M]
			[6M]

SECTION-V

9	a)	Deduce a relation between the Einstein's coefficients.	[10M]
	a)	Give few applications of Laser	
			[4M]

OR

[10M]	Explain in detail the construction and working of He-Ne laser.	a)
	Explain the terms population inversion and meta-stable states.	b)
[4M]		

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Regular Examinations, April/May 2019

Engineering Chemistry

(EEE, ECE, CSE & IT)



Time: 3 hours

2

Max. Marks: 70

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- **1** a) Give the expression for Nernst equation. Explain the terms in and **[5M]** applications of Nernst equation.
 - b) What is a cell? Give a comparative account on primary and secondary cells [4M] with examples..
 - c) Explain the mechanism of electrochemical corrosion by hydrogen [5M] evolution with cell reactions.

OR

- a) What is a Galvanic cell? Explain about construction and working of **[5M]** galvanic cell?
 - b) Define a secondary cell and discuss about Lithium ion battery [5M]
 - c) What is electroless plating? Write a note on advantages and applications of [4M] electroless plating.

SECTION-II

- 3 a) What are the postulates of molecular orbital theory? [4M]
 - b) Explain molecular energy level diagrams for N_2 molecule with the neat [6M] diagram?
 - c) How to calculate crystal field splitting energy for tetrahedral field? [4M]

4	a)	What are the postulates of molecular orbital theory? Explain molecular energy level diagrams for O_2 molecule with the neat diagram?	[10M]
	b)	List out the silent features of crystal field theory?	[4M]
		SECTION-III	
5	a)	What are the advantages and disadvantages of hard water? How temporary hardness differ from permanent hardness?	[5M]
	b)	What is the principle involved in softening of water by ion exchange process? Write a short note on types of ion exchange resins used in ion	[6M]
	c)	Explain briefly about disinfection of water ozonisation.	[3M]
		OR	
6	a)	What is hardness of water? Which salts causes the permanent hardness and which salts causes the temporary hardness of water? How permanent	[5M]
	b)	Write a short note on specifications of portable water.	[4M]
	c)	With the help of neat diagram describe the reverse osmosis method for the desalination of brackish water.	[5M]
		<u>SECTION-IV</u>	
7	a)	What is Markownikoff's addition? Explain briefly with suitable examples.	[6M]
	b)	What is nucleophilic substitution?	[2M]
	c)	What are reduction reactions? Explain briefly reduction of carbonyl compounds using LiAlH ₄ .	[6M]
		OR	
8	a)	What are Oxidation reactions? Write a short note on oxidation of alcohols using KMnO ₄ and chromic acid	[6M]
	b)	Write a short on addition of Hbr to propene	[3M]
	c)	Define Nucleophiles? Write a short note on Nucleophilic addition	[5M]
		sections.	
9	a)	What is ultimate analysis of coal? Explain how the percentage of carbon,	[7M]
	b)	hydrogen, sulphur and oxygen is estimated by ultimate analysis of coal.	[71/]
	D)	the advantages of catalytic cracking. OR	[7101]
10	a)	What are fuels? Explain how fuels are classified with suitable examples. Give an	[8M]
	b)	account on characteristics of good fuel. What is a natural gas? Give the composition, properties and applications of	[6M]
		natural gas. ******	

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Regular Examinations, April/May 2019

Object Oriented Programming

(Common to all Branches)



Time: 3 hours

3

Max. Marks: 70

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1	a) b)	a) Explain the key concepts of Object oriented programming.b) Explain the concept of Polymorphism.	
		OR	
2	a) b)	Explain How Object oriented programming overcomes the drawbacks of Conventional programming. Differentiate between Abstraction and Encapsulation.	[7M]
			[7M]

SECTION-II

- a) How members function is defined inside a class and outside the class? Explain [7M] with an example each.
 - b) Explain inline functions with an example.

[7M]

OR

4	a)	Write C++ program to add two numbers using friend functions.	[7M]
	b)	Illustrate with an example the mechanism of defining a member function and	
		overloading it.	[7M]

SECTION-III

5	a)	What is a constructor? Write different rules associated with declaring	[7M]
	b)	Explain hybrid inheritance with a C++ example	
			[7M]
		OR	
6	a)	Explain about default and parameterized constructors with suitable examples	[7M]
	b)	What are different types of inheritance supported by C++? Give an example for each.	[7M]
		SECTION-IV	
7	a)	Discuss about virtual functions with a C++ example.	[7M]
	b)	Write a C++ program to overload increment operator	[7M]
		OR	
8	a)	Write about operator overloading in C++ with an example	[7M]
	b)	What is function overloading? What are the principles of function overloading	[7M]
		SECTION-V	
9	a)	Explain the concept of Class Template.	[7M]
-	b)	Write a C++ program those implements function templates.	[7M]
		OP	[, 141]
10	a)	Define template. What is the need for templates in programming? Write C++ code that declares a Template class.	[7M]
	b)	Write a C++ program that catches any exception.	
			[7M]

(Autonomous Institution – UGC, Govt. of India)

I B.Tech II Semester Regular Examinations, April/May 2019

Basic Electrical Engineering

(EEE, ECE, CSE & IT)

Roll No					

Time: 3 hours

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

Max. Marks: 70

SECTION-I

- 1 a) Three resistances of values 2Ω,3Ω and 5Ω are connected in series across 20V DC supply. [8M] Calculate i) Equivalent resistance of the circuit. ii) The total current of the circuit. iii) The voltage drop across each resistor. iv) The power dissipated in each resistor
 - b) Demonstrate the equivalence of practical voltage and current source.

[6M]

OR

2	a)	State KCL and KVL	[4M]
	b)	Using KCL and KVL, find the currents in all the sources of the circuit of the following figure	

[10M]

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3 State superposition theorem and find the current through 2Ω resistance using [14M] superposition theorem for the circuit shown below:



4 Find the voltage to be applied across AB in order to drive a current of 5 A into the circuit shown **[14M]** in figure below. Use Star-Delta transformation



SECTION-III

5 Two coils of 5 Ω and 10Ω and inductances 0.04 H and 0.05 H respectively are connecting in [14M] parallel across a 200 V, 50 Hz supply. Calculate: (i) Conductance, susceptance and admittance of each coil. (ii) Total current drawn by the circuit and its power factor. (iii) Power absorbed by the circuit. (iv) The value of resistance and inductance of single coil which will take the same current and power as taken by the original circuit.

OR

6 A series RLC circuit containing a resistance of 20Ω, an inductance of 0.25H and a capacitor of [14M] 50uF are connected in series across a 120V, 50Hz supply. Calculate the total circuit impedance, the circuits current, power factor and draw the voltage phasor diagram

SECTION-IV

7	(a)Explain principle of operation of transformer.					
	(b)An ideal transformer has 1000turns on its primary and 500 turns on its secondary the driving voltage of primary side is 100V and the load resistance is 5 Ω , calculate V2, I1 and I 2					
	OR					
8	a) Analyze the Back Emf and its significance in DC Motor	[8M]				
	b) State Lorentz Law and Fleming Left Hand Rule.	[6M]				
	SECTION-V					
9	Discuss the Voltage Operated ELCB and Current Operated ELCB with neat diagrams.	[14M]				
	OR					
10	Discuss the operation characteristics and applications of SFU, MCB, ELCB & MCCB	[14M]				

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(Autonomous Institution – UGC, Govt. of India)

I B. Tech II Semester Regular Examinations, April/May 2019

Engineering Graphics

(ME & AE)



Time: 3 hours

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 (a) Construct a regular heptagon in a circle of 90 mm diameter by [4M] general method.
 - (b) The distance between two stations is 10 km and on a map it is shown by 3cm line. Draw a diagonal scale and mark a distance of 45.6 km on it.

[10M]

OR

- (a) Construct a parabola whose vertex is at a distance of 40 mm from [7M] the focus. Draw a tangent and normal at a point 100 mm away from the directrix.
 - (b) Draw a hyperbola whose focus and vertex are 30 mm apart with eccentricity ratio of 3/2. Use eccentricity method. Draw a tangent and normal to the curve at point 30 mm from the focus.

[7M]

SECTION-II

(a) Draw the projections on a common reference line for (i) Point P [6M] when it is 30 mm below HP and in the VP (ii) Point Q when it is 45 mm above HP and 20 mm behind the VP (iii) Point R which is in both HP and VP.

3

2

(b) The front view of a 80 mm long line AB measures 50 mm. The line lies in the HP such that one end A is 30 mm in front of VP. Draw the projections of the line and find its inclination with VP.

[8M]

OR

4 A 90 mm long line AB has the end A 20 mm above the HP and 35 mm in front of [14M] the VP. The end B is 80 mm above the HP and 60 mm in front of the VP. Draw the projections of AB and determine its true inclinations with the planes.

SECTION-III

5 A semi circular plane of diameter 80 mm has its straight edge on the HP and **[14M]** inclined at 45° to the VP. The plane surface is inclined at 30° to the HP. Draw its projections.

OR

6 A pentagonal pyramid of side of the base equal to 40 mm and axis length 70 [14M] mm is resting on a corner of its base on HP such that the base is inclined to HP at 45°. The base edge opposite to the resting corner is inclined at 60° to the VP. Draw the projections of the pentagonal pyramid.

SECTION-IV

7 Draw the isometric view of a cylinder of base diameter 50 mm and axis
 70 mm for the following cases. The axis of the cylinder is perpendicular to the H.P

OR

8 Draw the isometric of a pentagonal pyramid of base side 30 mm and axis [14M] 60 mm for the following two cases. The pyramid is kept on its base on the H.P

SECTION-V

9 Draw the orhtographic projections showing front view, top view and Left hand **[14M]** side view for the bracket shown in Figure 1.

OR

10 Draw the isometric view from the orthographic projections shown in Figure 2 **[14M]**





Figure 2

Figure 1
