Q.P. Code: 1802103 **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. I Sem. (R18) Supplementary Examinations of May 2019

SUB: BASIC ELECTRICAL ENGINEERING (ECE & CSE)

Time: 3 Hours Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Define and explain basic circuit elements.
   (b) Define and explain KCL & KVL with neat diagram.

(OR)

2. (a) Explain the division of current in the parallel branches.
   (b) A circuit consists of three resistances of 12, 18 and 36 ohms respectively by joined in parallel and the combination is connected in series with a resistance of 12 ohms. The whole circuit is connected to 60 V supply. Calculate current in each branch, total current drawn and power dissipated in each resistor.

UNIT – II

3. (a) Define the following with respect to sinusoidal quantity: i) RMS Value ii) Average Value iii) Form factor iv) Peak factor.
   (b) A coil has a resistance of 4 Ω and an inductance of 9.55 mH. Calculate (i) the reactance, (ii) the impedance, and (iii) the current taken from a 240V, 50 Hz supply. Determine also the phase angle between the supply voltage and current.

(OR)

4. (a) Derive an expression for average value of an AC current wave form $I = E_m \sin \theta$
   (b) An alternating current is expressed as I = 14.14 sin 314t. Determine.
   i. Maximum current ii. Rms current
   iii. Frequency iv. Instantaneous current when t = 0.02msec.

UNIT – III

5. (a) Explain the principle of operation of DC generator
   (b) A lap wound DC generator having 80 slots with 10 conductors per slot generator at no load emf of 400v, when running at 1000 rpm. At what speed should it be rotated to generate a voltage of 220v on open circuit.

(OR)

6. (a) Derive the torque equation of a DC motor
   (b) A 200 V DC shunt motor takes a total current of 100 A and runs at 750 rpm. The resistance of the armature winding and shunt field winding is 0.1 ohms and 40 ohms respectively. Find the copper losses. If the friction and iron losses amount to 1500 W, also calculate efficiency.

UNIT – IV

7. (a) Derive the Emf equation of a Transformer
   (b) A 5 kVA, 220/110 volts, 1-phase transformer has a maximum efficiency of 96.97 % at 0.8 p.f. lagging. It has a core loss of 50 watts and full load regulation at 0.8 p.f. lagging is 5 %. Find the efficiency and regulation at full load 0.9 p.f lagging.

(OR)

8. (a) Explain with the help of diagram how a rotating magnetic field is produced in a 3- phase Induction Motor.
   (b) A 12-pole, 3-induction motor runs at 485 rpm on a 50 Hz supply. Calculate slip.

UNIT-V

9. (a) What is fuse? Differentiate between fuse and circuit breaker.
   (b) Explain about different types of cables and significance of Earthing

(OR)

10. (a) Explain about series and parallel connection of batteries.
    (b) Explain about miniature circuit breaker and power converters.

Q.P. Code: 1805104 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. I Sem. (R18) Supplementary Examinations of May 2019

SUB: PROGRAMMING FOR PROBLEM SOLVING (CE, EEE & ME)

Time : 3 Hours | Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.		How an Algorithm differ from flow chart? Write an algorithm, Flowchart for finding greatest among three given numbers?	14M
		(OR)	
2.	(a)	Define Computer? Explain Block diagram of computers with a neat sketch?	7M
	(b)	Write a short note on computer hardware and software?	7M

UNIT – II

3.	(a)	What are bitwise operators in C? Write a c program to shift input data by two bits right.	7M
	(b)	Write a C Program swapping of to numbers without using third variable?	7M
		(OR)	
4.	(a)	Explain the difference between While and do-while?	7M
	(b)	Write a program to find the series of prime numbers in the given range	7M

UNIT – III

5.		Write a program to read matrix and perform the following operations. i. Find the sum of Diagonal Elements of a matrix. ii. Print Transpose of a matrix. iii. Print sum of even and odd numbers in a given matrix.	14M
		(OR)	
6.		What is a String? Write a program to accept a line of characters and print the count of the number of Vowels, Consonants, blank spaces, digits and special characters.	14M

UNIT – IV

7.	(a)	Define pointer? Explain declaration and initialization of a pointer with an example?	7M
	(b)	What is recursion? Write a C program to find factorial of a given number using recursion?	7M
		(OR)	
8.	(a)	Explain categories of functions with respect to parameters and return values?	7M
	(b)	Distinguish between Call-By-Value and Call-By-Reference	7M

UNIT-V

9.	(a)	Define structure and write the general format for declaring, initializing and accessing member?	7M
	(b)	What is meant by Structure with in structure? Give an example?	7M
		(OR)	
10.	(a)	How to copy one structure to another structure of a same data type? Give an example?	7M
	(b)	Explain the Similarities and difference Between Structures and Unions?	7M

Q.P. Code: 1821101 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Supplementary Examinations of May 2019
SUB: MATHEMATICS-I (Common to all Branches)

Time: 3 Hours | Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT – I

1. (a) Determine the rank of the matrix $\begin{bmatrix} 1 & 2 & 1 & 0 \\ -2 & 4 & 3 & 0 \\ 1 & 0 & 2 & -8 \end{bmatrix}$ by reducing it into normal form. 7M

   (b) Diagonalize the matrix $\begin{bmatrix} 1 & 0 & -1 \\ 1 & 2 & 1 \\ 2 & 2 & 3 \end{bmatrix}$ and find A^4. 7M

(OR)

2. (a) For what values of λ and μ the simultaneous equations 7M
   2x + 3y + 5z = 9, 7x + 3y – 2z = 8, 2x + 3y + λz = μ have
   (i) no solution (ii) unique solution (iii) infinite no. of solutions.

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

UNIT – II

3. (a) Test the convergence of the series $\sum_{n=1}^{\infty} \frac{1}{2^n+3^n}$. 7M

   (b) Test the convergence of the series $\frac{3.6.9.....3n}{4.7.10.....(3n+1)} \; \frac{5^n}{3n+2}$. 7M

(OR)

4. (a) Test the convergence of the series $\sum \frac{\left(1+\frac{1}{n}\right)^{2n}}{e^n}$. 7M

   (b) Test the convergence of the series $\sum \sqrt{n^4+1} - \sqrt{n^4-1}$. 7M

UNIT – III

5. (a) Find the Taylor's series expansion of log (1 + x) about $x = 0$. 7M

   (b) Find the radius of curvature of $x = a(\cos t + \log \tan\left(\frac{t}{2}\right)), y = a \sin t$. 7M

(OR)

6. (a) Prove that the evolute of the cycloid $x = a(t - sint), y = a(1 - cost)$ is another cycloid. 7M

   (b) Find the envelope of a family of straight lines $= mx + \frac{a}{m}$, where m is the parameter. 7M

UNIT – IV

7. (a) Find the maximum and minimum values of 7M
   $f(x, y) = x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x.$

   (b) If $u = \frac{yz}{x}$, $u = \frac{zx}{y}$, $u = \frac{xy}{z}$, then show that $\frac{\partial(u,v,w)}{\partial(x,y,z)} = 4$. 7M

(OR)

8. (a) If $u = \frac{1}{\sqrt{x^2+y^2+z^2}}$ $(x^2 + y^2 + z^2 \neq 0)$, then prove that $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = 0$. 7M

(b) Find a point on the plane $3x + 2y + z - 12 = 0$, which is nearest to the origin. 7M

UNIT-V

9. (a) Evaluate $\iint_R y\, dxdy$, where R is the region bounded by $y - axis,\ y = x^2$ and $x + y = 2$. 7M

(b) Show that $\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$. 7M

(OR)

10. (a) Find Fourier series of $f(x) = x \quad in\ [-\pi, \pi]$. 7M

(b) Show that $\int_0^a (a-x)^{m-1}\, x^{n-1} dx = a^{m+n-1}\, \beta(m, n)$. 7M

Q.P. Code: 1822102 **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Supplementary Examinations of May 2019
SUB: ENGINEERING PHYSICS (ECE)

Time: 3 Hours Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Explain the principle of superposition of waves.	4M
	(b)	Describe the energy and power dissipation in damped harmonic oscillations with necessary expressions.	6M
	(c)	A particle of mass 0.005 kg executes simple harmonic motion with amplitude of 0.08 m. Its frequency is 18 Hz. Find its maximum velocity and energy at mean position.	4M
		(OR)	
2.	(a)	Distinguish between damped and forced harmonic oscillators.	4M
	(b)	Describe forced harmonic oscillations along with different cases of amplitude and phase.	10M

UNIT – II

3.	(a)	Describe Young's double slit experiment and derive the expression for the fringe width.	10M
	(b)	A light source emits light of two wavelengths λ_1= 4200 A^0 and λ_2= 4350 A^0 in young's double slit experiment. The distance between the slits and the screen is 2.5 m and the distance between the slits is 0.035 mm. Find the separation between the second bright fringes due to these two wavelengths.	4M
		(OR)	
4.	(a)	Distinguish between Interference and Diffraction phenomena of light	4M
	(b)	Mention the significant features of Fraunhofer diffraction of light.	4M
	(c)	Explain the working principle of diffraction grating and mention its applications.	6M

UNIT – III

5.	(a)	Explain the interaction of radiation with matter.	3M
	(b)	Derive the relation between various Einstein's coefficients related to absorption and emission of radiation.	8M
	(c)	Mention the important characteristics of laser light.	3M
		(OR)	
6.	(a)	Explain stimulated emission of Radiation.	4M
	(b)	Describe the construction and working of semiconductor p-n junction diode laser.	6M
	(c)	Mention the significant applications of laser.	4M

UNIT – IV

7.	(a)	Explain the physical significance of wave function.	4M
	(b)	Derive time dependent Schrodinger's wave equation.	6M
	(c)	Explain uncertainty principle.	4M
		(OR)	
8.	(a)	Describe the behavior of a free particle in a one dimensional Potential box with the help of Eigen energy values and corresponding wave functions.	10M
	(b)	An electron is bound in a one dimensional potential well of width 0.2nm. Find its energies in the first and second excited states. Given h=6.63×10^{-24} JS and m=9.1×10^{-31}Kg	4M

UNIT-V

9.	(a)	Derive the expression for electrical conductivity in metals using free electron theory.	10M
	(b)	Explain the origin of energy band structure of solids.	4M
		(OR)	

10.	(a)	What are intrinsic and extrinsic semiconductors?.	4M
	(b)	Distinguish between drift and diffusion of charge carriers.	5M
	(c)	Explain the working principle of p-n junction.	5M

Q.P. Code: 1822104 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Supplementary Examinations of May 2019
SUB: ENGINEERING PHYSICS (CSE)

Time : 3 Hours | Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Mention the conditions to obtain bright and dark fringes due to interference in thin film by reflection.	4M
	(b)	Describe the formation of Newton's rings with necessary theory.	7M
	(c)	In a Newton's rings experiment, the diameter of the 10^{th} dark ring due to wavelength 5500 A^0 in air is 0.25 cm. Find the radius of curvature of the lens.	3M
		(OR)	
2.	(a)	Distinguish between Interference and Diffraction phenomena of light	4M
	(b)	Mention the significance of Fraunhofer diffraction of light.	4M
	(c)	Describe diffraction grating and mention its applications.	6M

UNIT – II

3.	(a)	Mention various excitation mechanisms to obtain population inversion	3M
	(b)	Describe the construction and working of Nd:YAG laser with neat energy level diagram.	7M
	(c)	Distinguish between Spontaneous and stimulated emission of Radiation.	4M
		(OR)	
4.	(a)	Explain stimulated emission of Radiation.	4M
	(b)	Describe the construction and working of semiconductor p-n junction diode laser.	6M
	(c)	Mention the significant applications of laser.	4M

UNIT – III

5.	(a)	Explain E-K diagram resulting in allowed and forbidden energy bands.	5M
	(b)	Distinguish between direct and indirect band gap semiconductors.	5M
	(c)	Explain the significance of Fermi level in energy band structure.	4M
		(OR)	
6.	(a)	Derive the expression for conductivity in metals using free electron theory.	10M
	(b)	Mention the importance of density of states in materials.	4M

UNIT – IV

7.	(a)	Distinguish between intrinsic and extrinsic semiconductors.	5M
	(b)	Explain the importance of carrier generation and recombination of charge carriers in a semiconductor.	5M
	(c)	Distinguish between drift and diffusion of charge carriers.	4M
		(OR)	
8.	(a)	Explain the working principle of p-n junction.	5M
	(b)	Explain the effect of temperature on Fermi level of a semiconductor.	5M
	(c)	Mention the importance of Schottky metal semiconductor junction.	4M

UNIT-V

9.	(a)	Explain the various optical properties exhibited by nanomaterials.	4M
	(b)	Explain the sol gel method for the synthesis of nanomaterials.	10M
		(OR)	
10.	(a)	Explain the various magnetic properties exhibited by nanomaterials.	4M
	(b)	Describe the synthesis of nanomaterials by Chemical vapour deposition Method.	10M

Q.P. Code: 1823102 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Supplementary Examinations of May 2019
SUB: ENGINEERING CHEMISTRY (CE, EEE & ME)

Time: 3 Hours | Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Write the Schrodinger wave equation and give its significance in Chemistry.	5M
	(b)	Explain the crystal field theory. How this theory explain the magnetic properties of transition metal ions?	9M
		(OR)	
2.	(a)	Distinguish atomic and molecular orbitals.	4M
	(b)	Explain the plots of multicenter orbitals with example.	10M

UNIT – II

3.	(a)	Discuss effective nuclear charge and coordination numbers	8M
	(b)	Summarize your understanding about electronic configurations	6M
		(OR)	
4.	(a)	Define Atomic size, Electron affinity and Ionization energies. How the following periodic properties vary? Justify your answer	9M
	(b)	Define polarizability. What affects polarizability?	5M

UNIT – III

5.	(a)	Derive the Nernst equation and write its applications	7M
	(b)	How the nature of the corroding environment influence the corrosion?	7M
		(OR)	
6.	(a)	Summarize ionic, dipolar and van Der Walls interactions	12M
	(b)	Define entropy	2M

UNIT – IV

7.	(a)	Explain briefly about fluorescence and write its applications.	8M
	(b)	Can you write the basic principles of spectroscopy	6M
		(OR)	
8.		Summarize your understanding about vibrational and rotational spectroscopy of diatomic molecules	14M

UNIT-V

9.	(a)	Can you write in your own words about i) structural isomers and stereoisomers ii) enantiomers and diasteromers?	8M
	(b)	Write the Markovnikov's rule and apply this rule in C=C addition reactions	6M
		(OR)	
10.		Describe Baeyer villager reaction and Clemmensen reduction	14M

Q.P. Code: 1824103 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Supplementary Examinations of May 2019
SUB: ENGLISH (CE, EEE, ME)

Time : 3 Hours | Max. Marks: 70

Answer any FIVE Questions.
All questions carry Equal Marks.

1. **Correct any FOURTEEN of the following sentences if necessary.** 14M

(i) I visited the Nepal last year.
(ii) He is not use to do the homework.
(iii) I have left my home town in August, 2013.
(iv) That bungalow is built in the eighteenth century.
(v) He asked me where is the mall.
(vi) Kanchipuram is near to Chennai.
(vii) She played well and lost.
(viii) Do you know London?
(ix) She plays guitar well.
(x) I haven't money since I lost my job.
(xi) Can you explain me this?
(xii) At the end, I was able to complete my project.
(xiii) If you are not watching the TV, turn off it.
(xiv) They agreed for meeting at Vienna.
(xv) The pulses recurs at regular intervals.
(xvi) The students accompanied by their teacher has gone on a picnic.
(xvii) She is making rapid progress.

2. (a) What is a root word? Write three examples with suffix and prefix for each root word. 7M
   (b) (I) Give a synonym for each of the following: 7M
   (i) flaunt (ii) approximate (iii) reward (iv) abundant
   (II) Give an antonym for each of the following:
   (i) contrary (ii) deliberate (iii) contemporary

3. (a) Draft a dialogue between two friends working on a project whose deadline is Approaching. 7M
   (b) Give the meanings of the following idioms and phrases and use them in sentences of your own. 7M
   (i) driving me bananas (ii beat around the bush (iii) bolt from the blue
   (iv) once in a blue moon (v) adding insult to injury (vi) shot in the arm
   (vii) break a leg

4. (a) (I) Make 5 meaningful sentences in the given pattern. An example is given. 7M

Subject +	Verb +	Object +	+ to infinitive
Chitra	told	Me	to buy a new home

(II) Punctuate the following sentence.

Into the face of the young man who sat on the terrace of the Hotel Magnifique at cannes there had crept a look of furtive shame the shifty hangdog look which announces that an englishman is about to talk French.(*The Luck of the Bodkins*, P. G. Wodehouse)

   (b) Write short notes on unity, coherence and balance of an essay. 7M

5. (a) Rewrite the following sentences as directed. 7M

(i) Her attempt was crowned with success. (Rewrite the sentence using the verb form of 'success')

(ii) I do not intend to live here. (Rewrite the sentence using the noun form of 'intend')

(iii) She works hard. (Rewrite the sentence using the adjective form of 'hard')

(iv) The crew paved the entire stretch of the road. (Change into passive voice)

(v) The application for a new job was faxed by her. (Change into active voice)

(vi) The lecturer said to us, "I expect you to take classes." (Change into indirect speech)

(vii) My mother reminded me to take an umbrella. (Change into direct speech)

(b) Rewrite the following sentences as directed. 7M

(i) Everest is the highest peak in the world. (Change into comparative degree)

(ii) No other metal is as precious as Gold. (Change into superlative degree)

(iii) The Amazon is longer than the Nile. (Change into positive degree)

(iv)Hyderabad is more polluted than many other cities. (Change into positive degree)

(v) He bought the factory that belonged to his uncle. (Change into simple sentence)

(vi)He fled for fear of being arrested. (Change into compound sentence)

(vii)He was ill and did not attend school. (Change into simple sentence)

6. (a) **(I)** Fill in the blanks with suitable articles. 7M

(i) The girl is not _____ Indian.

(ii) The train was late by _____ hour.

(iii) The elephant is _____ huge animal.

(II) Fill in the blanks with appropriate prepositions.

(i) I have been ill _____ a week.

(ii) Have you ever travelled _____ air?

(iii) Sign your name _____ the dotted line.

(iv) My grandfather used to swim _____ the river to reach school.

(b) **(I)** Fill in the blanks with correct verb forms. 7M

(i) He _____ (watch) television all day.

(ii) He is _____ (open) the window.

(iii) Every one of them _____ (practise) every day.

(iv) I _____ (see) the movie two years ago.

(v) My family is _____ (have) lunch now.

(II) Fill in the blanks with suitable conjunctions.

(i) People liked the leader _____ he was honest.

(ii) It is a problem _____ solution baffled everyone.

7. (a) **Read the given passage and answer the questions given below.** 7M

Helium – an inert, odourless, monatomic element known to lay people as the substance that makes balloons float and voices squeak when inhaled – could be gone from this planet within a generation.

Helium itself is not rare; there is actually a plentiful supply of it in the cosmos. In fact, 24 per cent of our galaxy's elemental mass consists of helium, which makes it the second most abundant element in our universe. Because of its lightness, however, most helium vanished from our own planet many years ago. Helium is the by-product of millennia of radioactive decay from the elements thorium and uranium. This helium is mostly trapped in subterranean natural gas bunkers and commercially extracted through a method known as fractional distillation.

The loss of helium on Earth would affect society greatly. Probably the most well known commercial usage is in airships. But helium is also instrumental in deep-sea diving, as a cleaning agent for rocket engines; and, in its most prevalent use, as a coolant for superconducting magnets in hospital MRI (magnetic resonance imaging) scanners.

The unique qualities of helium are extraordinarily difficult, if not impossible to duplicate. According to Dr. Lee Sobotka, helium is the "most noble of gases, meaning it's very stable and non-reactive for the most part … it has a closed electronic configuration, a very tightly bound atom. It is this coveting of its own electrons that prevents combination with other elements'. Another important attribute is helium's unique boiling point, which is lower than that for any other element.

The worsening global shortage could render millions of dollars of high-value, life-saving equipment totally useless. Therefore, all existing supplies of helium ought to be conserved and released only by permit, with medical uses receiving precedence over other commercial or recreational demands. Secondly, conservation should be obligatory and enforced by a regulatory agency. Lastly, research into alternatives to helium must begin in earnest. (source: http://www.ieltstutors.org)

(i) According to the writer, _____ could be gone from this planet within a generation.

(ii) Which quality caused most helium to vanish from the earth?

(iii) What is the most widespread use of helium in the medical field as mentioned by the writer?

(iv) What prevents the combination of helium with other elements?

(v) What is the method used for commercial extraction of helium?

(vi) What, according to the writer, is the estimated loss that can occur due to shortage of helium?

(vii) Give an antonym for the word 'worsening.'

(b) **Write a précis of the following paragraph.** 7M

Today there are 3000 million people in the world. Fifty years ago only about 2000 millon people lived in it. If Earth's population were evenly distributed over its land surgace, there would be about 550 persons to the square mile. But Earth has vast areas of forest, mountains and desert which are almost totally uninhabited. On the other hand, it has great cities each with millions of people living in a few square miles.

To feed the fast growing population of our earth, scientists and planners have to discover new ways to produce more food. One possible way is to bring more land not under cultivation into cultivation. This can be done only in places where there is lot of land not used for productive purposes. In many places this is no longer possible as all the available land is already cultivated. A second way is to make use of new types of seeds to produce more food. Already a number of new strains of paddy and wheat have been developed in different parts of the world. India is one of the countries where a lot of useful work has been done in the field of agriculture research. (Source: http://lib.vcomsats.edu.pk/library)

8. (a) Write an essay on the following topic in about 250 words. 7M

What is 'successes according to you? How do you plan to achieve it?

(b) Expand the following into a paragraph. 7M

"Actions speak louder than words."