Q.P. Code: 1802103 | **SET - 1**

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

B. Tech. I Sem. (R18) Regular & Supple. Examinations of January, 2020

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) For the bridge network shown in Figure 1, determine the currents in each of the resistors. 8M

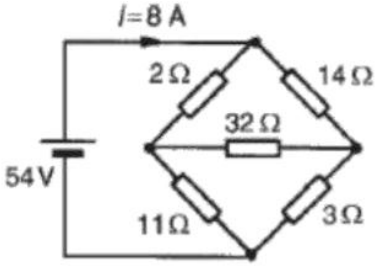

Figure 1

(b) What is source transformation? Explain in brief. 6M

(OR)

2. (a) Apply nodal analysis to determine the currents in the network of Figure.2 given below 8M

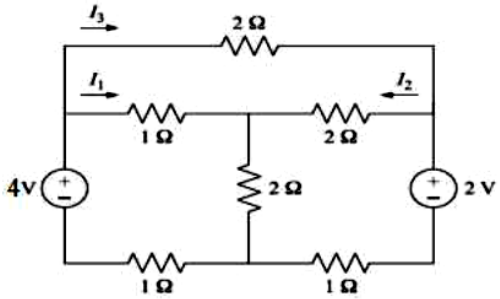

Figure 2

(b) Explain kirchoff's laws with one example each. 6M

UNIT – II

3. (a) A resistance of 20 Ω and an inductance of 0.2 H are connected in series and are fed by a 230 V, 50 Hz, single-phase AC supply. Find (i) inductive reactance, X_L, (ii) impedance, Z, (iii) current supplied by the source, I and (iv) active power drawn by the load, P. 8M

(b) Define (i) Average value, (ii) R.M.S. value, (iii) Form factor and (iv) Crest factor. 6M

(OR)

4. (a) An alternating voltage is given by v(t) = 282.8 sin(314t) volts. Find (i) Peak value, (ii) R.M.S. value, (iii) Frequency and (iv) Average value. 8M

(b) Define i) Impedance ii) Power factor iii) Real power iv) Reactive power 6M

UNIT – III

5. (a) Derive EMF equation of a DC Generator with necessary diagrams. 7M

(b) Explain construction & Principle of operation of a DC Generator with neat diagrams 7M

(OR)

6.	(a)	The useful flux of an 8 pole lap connected DC generator is 40mWb. Determine the number of conductors on the armature periphery if it has no-load voltage of 250 V and rotates at a speed of 500 rpm.	7M
	(b)	What is the need for commutator and brush arrangement in DC machines? Explain with neat diagrams.	7M

UNIT – IV

7.	(a)	A 100 kVA, 4000V/200V, 50 Hz single-phase transformer has 100 secondary turns. Determine (i) the primary and secondary current, (ii) the number of primary turns, and (iii) the maximum value of the flux.	7M
	(b)	Derive EMF equation of a 1-phase transformer.	7M

(OR)

8.	(a)	What is the principle of working of Induction motor? Explain with neat diagrams.	7M
	(b)	Explain the constructional details of induction motor with necessary diagrams	7M

UNIT-V

9.	(a)	What is switch gear? List various switch gear equipment.	7M
	(b)	Explain earthing with necessary diagrams.	7M

(OR)

10.	(a)	What are the essential features of switch gear? Explain in brief.	7M
	(b)	What is a power converter? Explain its importance in electrical circuits.	7M

Q.P. Code: 1805104 | **SET - 1**

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

B. Tech. I Sem. (R18) Regular & Supple. Examinations of January 2020

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.	(a)	Define Software. Explain various types of software with examples.	7M
	(b)	Explain briefly about Flowchart. Draw flowchart to find biggest among three numbers.	7M
		(OR)	
2.	(a)	Explain and illustrate basic structure of C program with example.	7M
	(b)	Define Data type. Explain various data types available in C. Write a C program to find sum of 'n' natural numbers.	7M

UNIT – II

3.		Explain the different types of operators available in C with suitable example programs.	14M
		(OR)	
4.		Explain in detail about looping statements with its appropriate syntax and example program for each.	14M

UNIT – III

5.	(a)	Explain in detail about 2-D arrays with syntax to declare and initialize 2-D arrays. Write a C program to perform matrix multiplication.	8M
	(b)	Write a C program to sort the elements 10, 56, 23, 5, 34 in ascending order using selection sort.	6M
		(OR)	
6.	(a)	Define string. Write syntax to declare and initialize strings. Write a C program to read String using scanf() and getchar() functions.	7M
	(b)	Explain string I/O functions with appropriate syntax and example program for each.	7M

UNIT – IV

7.	(a)	Define Function. Explain categories of functions with examples.	10M
	(b)	Write a C program to find factorial of a number using recursive function.	4M
		(OR)	
8.	(a)	Explain accessing the address of variables and accessing a variable through a pointer with examples.	8M
	(b)	Explain briefly about chain of pointers with examples.	6M

UNIT-V

9.	(a)	Define structure. Explain structure within structure with syntax and example.	7M
	(b)	Write a C program to create employee pay roll using structure.	7M
		(OR)	
10.	(a)	Define Union. Explain declaration and initialization of union with appropriate syntax and example.	10M
	(b)	Differentiate structure and union.	4M

Q.P. Code: 1821101 | **SET - 1**

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

B. Tech. I Sem. (R18) Regular & Supple. Examinations of January 2020

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) Reduce the matrix $A=\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$ into normal form and hence find its rank. 7M

(b) Discuss for what values of λ and μ the simultaneous equations $2x+3y+5z=9,\ 7x+3y-2z=8,\ 2x+3y+\lambda z=\mu$ have 7M

(i) no solution (ii) a unique solution (iii) an infinite number of solutions.

(OR)

2. Verify Cayley-Hamilton theorem for the matrix $A=\begin{bmatrix} 4 & 3 & 1 \\ 2 & 1 & -2 \\ 1 & 2 & 1 \end{bmatrix}$ and find its inverse. 14M

UNIT – II

3. Test for convergence the series 14M

$(i)\ 1+\frac{2}{5}x+\frac{6}{9}x^2+\frac{14}{17}x^3+.....+\frac{2^n-2}{2^n+1}x^{n-1}+...\infty\ (x>0)$.

$(ii)\ \sum\frac{(n+1)^n x^n}{x^{n+1}}$.

(OR)

4. (a) Discuss the convergence of the series $1+\frac{1}{2^2}+\frac{2^2}{3^3}+\frac{3^3}{4^4}+...\infty$. 7M

(b) Test the convergence of the series $\sum\frac{1}{n^3}\left(\frac{n+2}{n+3}\right)^n x^n\ \ \forall\ x>0$. 7M

UNIT – III

5. (a) Prove that $\log\left(1+\sin^2 x\right)=x^2-\frac{5}{6}x^4+\frac{32}{45}x^6+...\infty$. 7M

(b) Show that the right circular cylinder of given surface (including the ends) and maximum volume is such that its height is equal to the diameter of the base. 7M

(OR)

6. (a) If $\rho_1,\ \rho_2$ be the radii of curvature at the extremities of any chord of the cardioid $r=a(1-\cos\theta)$ which passes through the pole, show that $\rho_1^{\ 2}+\rho_2^{\ 2}=16a^2/9$. 7M

(b) Find the centre of curvature at the point $\left(\frac{a}{4},\frac{a}{4}\right)$ of the curve $\sqrt{x}+\sqrt{y}=\sqrt{a}$. Also find the equation of the circle of curvature at the point. 7M

UNIT – IV

7. (a) Determine $\frac{\partial(x,y,z)}{\partial(u,v,w)}$, when $x+y+z=u,\ y+z=uv,\ z=uvw.$ 7M

(b) Using Lagrange's method of undetermined multipliers, Find the volume of greatest rectangular parallelepiped that can be inscribed in the ellipsoid $\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1.$ 7M

(OR)

8. (a) Show that $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}+z\frac{\partial u}{\partial z}=0$, if $u=f(r,s,t)$ where $r=\frac{x}{y},\ s=\frac{y}{z}$ & $t=\frac{z}{x}.$ 7M

(b) Discuss the maxima and minima of a function $f(x,\ y)=x^3y^2(1-x-y).$ 7M

UNIT-V

9. Define Beta and Gamma functions. Also Derive the relation $\beta(m,n)=\frac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}.$ 14M

(OR)

10. (a) Express $f(x)=x$ as a half range sine series in $0<x<2.$ 7M

(b) Obtain the Fourier expansion of $x\sin x$ as a cosine series in $(0,\pi).$ Hence show that $\frac{1}{1.3}-\frac{1}{3.5}+\frac{1}{5.7}-...\infty=\frac{\pi-2}{4}.$ 7M

Q.P. Code: 1822102 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Regular & Supple. Examinations of January 2020
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)	Define simple harmonic motion and Obtain a relation between velocity and displacement.	8M
	(b)	Derive an expression for the energy of simple harmonic oscillator.	6M
		(OR)	
2.	(a)	What are forced oscillations? Obtain the equation of motion for forced oscillations.	8M
	(b)	Obtain the resonance condition for forced oscillations.	6M

UNIT – II

3.	(a)	Explain the phenomenon of interference and write the conditions for sustained interference.	6M
	(b)	Explain the formation of Newton`s rings in reflected light and derive the equation for the wavelength monochromatic light.	8M
		(OR)	
4.	(a)	Distinguish between the Fresnel and Fraunhofers diffraction. Discuss the Fraunhofers diffraction at a single slit and obtain the condition for maxima and minima.	10M
	(b)	In a single slit diffraction pattern the distance between the first maxima on either side of the central zero maximum is 4.4 mm as observed on a screen at a distance of 0.7 m. The wavelength of light used is 5890 A.	4M

UNIT – III

5.	(a)	Explain spontaneous and stimulated emission of radiation. Explain the construction and working of a He-Ne laser.	10M
	(b)	Write the applications of lasers.	4M
		(OR)	
6.	(a)	What is population inversion and derive the relation between various Einstein`s Coefficients.	6M
	(b)	Describe the construction and working of a Nd-YAG laser.	8M

UNIT – IV

7.	(a)	Derive Schrödinger's time independent and time dependent wave equation and explain the significance of wave function (ψ).	10M
	(b)	Find the velocity of a neutron whose de Broglie wave length is $1.4x10^{-10}$ m. Given $h=6.63x10^{-34}$J.Sec and mass of neutron is $1.675x10^{-27}$ kg.	4M
		(OR)	
8.	(a)	Write down the Schrödinger's wave equation for a particle in a box with infinite walls and solve to obtain eigen energy values and eigen functions.	10M
	(b)	Explain Heisenberg's uncertainty principle.	4M

UNIT-V

9.	(a)	What are the assumptions of classical free electron theory and derive an expression for conductivity of metals based on free electron theory.	10M
	(b)	What are the successes and failures of this theory?	4M
		(OR)	
10.	(a)	Discuss the Kronig –Penny model for the motion of an electron in a periodic potential and explain the formation bands in solids.	10M
	(b)	What are direct and indirect band gap semiconductors? Explain with examples.	4M

Q.P. Code: 1822104 **SET - 1**

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

B. Tech. I Sem. (R18) Regular & Supple. Examinations of January 2020

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)	Explain how can find the wavelength of light source using Newton's rings?	9M
	(b)	What are necessary conditions for obtaining interference of light?	5M
		(OR)	
2.	(a)	Explain the importance of diffraction grating	5M
	(b)	Describe Frauhofer diffraction due to single slit	9M

UNIT – II

3.	(a)	With neat diagram, explain the construction and working of a He-Ne laser	10M
	(b)	Explain the characteristics of laser	4M
		(OR)	
4.	(a)	Obtain the relation between Einstein's coefficients	7M
	(b)	What are the applications of lasers	7M

UNIT – III

5.	(a)	Difference between conductors , semiconductors and insulators	7M
	(b)	Difference between direct band gap and indirect band gap semiconductors	7M
		(OR)	
6.		Discuss with suitable mathematical expression, the Kronig-Penny model for the energies of the electron in a metal.	14M

UNIT – IV

7.	(a)	Describe drift and diffusion process in a semiconductor with the help of relevant expressions?	9M
	(b)	Distinguish between intrinsic and extrinsic semiconductor	5M
		(OR)	
8.	(a)	Explain the I-V characteristics of p-n junction diode	10M
	(b)	Mention the expression for Fermi energy levels for n- and p–type semiconductors?	4M

UNIT-V

9.	(a)	How does top-down approach is differing from bottom–up process approach?	5M
	(b)	Describe the synthesis of nano materials by ball mill?	9M
		(OR)	
10.	(a)	Mention applications of nano materials.	10M
	(b)	Define nano materials? How they are classified?	4M

Q.P. Code: 1823102 **SET - 1**

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

B. Tech. I Sem. (R18) Regular & Supple. Examinations of January 2020

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. Derive the Schrödinger wave equation to the electron present in an atom and give the significance of ψ and ψ^2. 14M

(OR)

2. N_2 molecule is more stable than O_2 molecule. How can you utilize the molecular orbital diagram in supporting this statement? 14M

UNIT – II

3. (a) Outline your understanding about hard and soft acids and bases 8M
   (b) Write a note on 6M
   i) Oxidation states ii) Coordination numbers

(OR)

4. (a) Summarize the variation of s, p, d and f orbital energies of atoms in the periodic table 10M
   (b) What is Polarizability? Why does it increase down the group? 4M

UNIT – III

5. (a) Derive the Nernst equation and list its major application 8M
   (b) Discuss briefly about dipolar and van Der Waals interactions 6M

(OR)

6. (a) Write a note on Entropy and Free energy. 6M
   (b) Explain the corrosion due to variation in metal ion concentration 8M

UNIT – IV

7. (a) Discuss the principles of electronic and vibrational spectroscopy 8M
   (b) List the applications of Fluorescence spectroscopy. 6M

(OR)

8. Define spectroscopy and explain vibrational and rotational spectra of diatomic molecules 14M

UNIT-V

9. (a) Explain the reaction of Grignard reagent with carbonyl compounds 7M
   (b) Write a comparison between mechanisms of SN^1 and SN^2 reactions. 7M

(OR)

10. (a) Write a short notes on structural isomers and stereoisomers. 8M
    (b) Describe Baeyer villiger reaction. 6M

Q.P. Code: 1824103 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Regular & Supple. Examinations of January 2020
SUB: ENGLISH (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) Enumerate the list of techniques used for writing precisely. 10M
   (b) Write a short note on: i) phrase ii) clause 4M

(OR)

2. (a) Define the term 'prefix' Add a suitable 'prefix' to form antonymous meaning for each of the following words (i) Conduct (ii) Honour (iii) Polite (iv) Characteristic (v) Regular 7M
   (b) Give one **Synonym** for each of the following words: (i) Accomplish (ii)Principal (iii) Admire (iv) Seldom 4M
   (c) Give one **Antonym** for each of the following words: (i) Gentle (ii)Expand (iii) Dawn 3M

UNIT – II

3. (a) Comment on the structure of a good paragraph. 7M
   (b) Punctuate the following : whats wrong with you 3M
   (C) State whether the following sentences are compound or complex: 4M
   i) You must go or I shall slap you.
   ii) When we reached back, it was quite dark.
   iii) Show me the place where he was killed.
   iv) A guest is unwelcome when he stays for too long.

(OR)

4. (a) Write a paragraph in about 150 words on 'Mobile Phone abuse'. 8M
   (b) Write a note on (i) Sentence structure (ii) Coherence 6M

UNIT – III

5. (a) i) His story is full of suspense.(Rewrite the sentence using 'suspense' as adjective) 7M
   ii) She spoke to me angrily. .(Rewrite the sentence using 'angrily' as noun)
   iii) Luckily my friend helped me. Rewrite the sentence using 'luckily' as adjective)
   iv) Syam drives the car.(Convert to the passive voice)
   v) The budget was cut by the committee.(Convert to the active voice)
   vi) I will never forget this experience. (Convert to the passive voice)
   vii) A novel has been written by him. (Convert to the active voice)
   (b) Rewrite the sentence by putting the misplaced modifier in its correct position for each of the sentences given below: 3M
   i) On his way home, Ramesh found a gold man's watch.
   ii) The torn student's book lay on the floor.
   iii) We ate the lunch that we had brought slowly.
   (c) Identify the tense forms of the underlined words. 4M
   i) How long <u>has</u> he <u>known</u> you?
   ii) Peacocks <u>live</u> in India.
   iii) The children <u>are playing</u> in the room.
   iv) I <u>had been waiting</u> nearly for an hour before you came.

(OR)

6. (a) i) The teacher said, 'I am busy today.' (Convert to the Indirect speech) 7M
ii) The guru said that God is everywhere.(Convert to the Direct speech)
iii) Kate said to me, 'I know the way.' (Convert to the Indirect speech)
iv) Jim said to Jane, 'you look nice in this dress.' (Convert to the Indirect speech)
v)'Just keep quiet', the judge told us. (Convert to the Indirect speech)
vi) Stephan wished he had a girlfriend. (Convert to the Direct speech)
vii) He asked, 'Ruby, do you have any answer?' (Convert to the Indirect speech)

(b) Fill in the blanks with an adjective of appropriate degree: 7M

i) You should do things _____carefully.(more/ most)
ii) Who is the _____girl in the class?(taller/tallest)
iii) The higher you go the, _____you feel.(cooler, coolest)
iv) He is more _____ than me. (cleverer/ clever)
v) No _____ (few/fewer) than ten persons were killed in the blast.
vi) The Anaconda is the_____ (large/ largest) of all snakes.
vii) Don't worry! He is _____ (better/more better) today.

UNIT – IV

7. (a) Rewrite each of the following sentences if necessary by choosing the correct form of the verb that agrees with the subject. 7M

i) The number of failures are high.
ii) A sealing wax is a type of wax that melt quickly.
iii) Each of the boys have won a prize.
iv) The chapter conclude on a sad note.
v) They doesn't represent the whole class.
vi) She thinks she know him well.
vii) Four years are a long time to complete this course.

(b) Identify and delete the redundant words/phrases and rewrite each of the following sentences. 7M

i) Foreign imports reduced considerably during the last year.
ii) It is better that the exams are postponed until later.
iii) This mobile is better because it has a RAM memory of 6GB.
iv) The employees are happy because they got an added bonus.
v) The end result of the experiment was not encouraging.
vi) There was a consensus of opinion that the Earth was flat.
vii) He returned back to his office yesterday.

(OR)

8. (a) Fill in the blanks with appropriate phrasal verbs 5M

i) The sun was _____ (beating down/ beating up)
ii) The newspaper was _____(flooded with/ flooded in)letters from readers.
iii) The terrorists _____(blew up/blew off) the bridge.
iv) How do you _____ (account for/ account of) your strange behavior?
v) How did your speech _____ with (go away/go down) the crowd?

(b) Fill in the blanks with suitable prepositions 5M

(i) The country is _____ war.
(ii) Soldiers die _____ their country.
(iii) She died _____ cancer.
(iv) Sheena congratulated Kamala _____ her success.
(v) He gave a gift _____his daughter.

(c) Fill in the blanks with suitable articles. 4M

i) He is _____honest man.
ii) I saw _____ one-eyed man the market.
iii) Steve is _____ European.
iv) He waited for ____ hour.

UNIT-V

9. (a) **Read the following passage and answer the questions given below it.** 6M

Read not to contradict and confute, nor to believe and take for granted, nor to find talk and discourse, but to weigh and consider. Some books are to be tasted, others to be swallowed, and some few to be chewed and digested; that is, some books are to be read only in parts; others to be read, but not curiously; and some few to be read wholly, and with diligence and attention. Some books may also be read by deputy, and extracts made of them by others; but that would be only in the less important arguments and the meaner sort of books; else distilled books are like common distilled waters, flashy things. Reading maketh a full man, conference a ready man, and writing an exact man. And therefore if a man write little, he had need have a good memory; if he confer little, he had need have a present wit; and if he read little, he had need have much cunning to seem to know that he doth not. 'Histories make men wise, poets witty, the mathematics subtle, natural philosophy deep, moral, grave, logic and rhetoric, able to contend.'

Questions

1. What does the art of writing do to man's character?
2. How should you read those books which are to be 'read wholly'?
3. If a man does not write much, what must he have?
4. What does 'some books are to be tested' mean?
5. What should be the real object of reading?
6. What can be done with regard to the 'meaner' sort of books?

(b) List some important Dos and Don’ts of Précis writing. 8M

(OR)

10. (a) Write an essay on ‘Role of youth in society’. 7M

Write the meanings of the following idioms and use them in your own words. 7M

(b) i) A Black sheep ii) Red letter day iii) By leaps and bounds
iv) Add insult to injury v) Over the moon vi) A blessing in disguise vii) All ears