

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Supplementary Examinations of September – 2021
SUB: Basic Electrical Engineering (ECE & CSE)

Time: 3 Hours

Max. Marks: 70

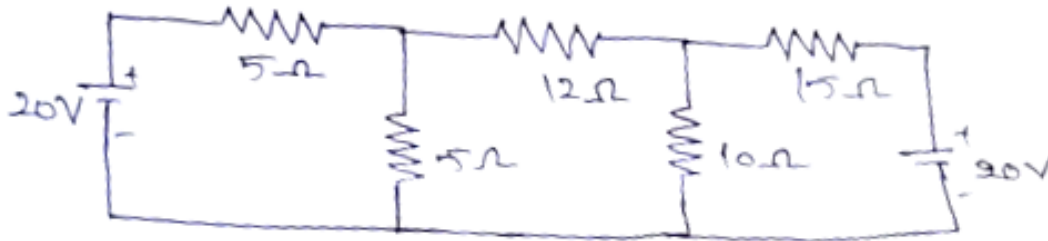
Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

UNIT - I

1.

14M



Determine the power supplied by 20V. by using nodal analysis.

(OR)

2.

Derive the equations for delta to star transformations?

14M

UNIT – II

3.

Derive form factor and peak factor for full sine wave function?

14M

(OR)

4.

A 50Ω resistor is connected in series with a $25\mu\text{F}$ Capacitor across a 230V, 50HZ AC Supply. Determine (a) Capacitive reactance (b) Impedance (c) Current (d) Phase angle (e) Voltage drop across resistance (f) Power Factor.

14M

UNIT – III

5.

What are the different types of DC Generators? Write the relationship between Induced emf and terminal voltage with diagrams?

14M

(OR)

6.

(a) Derive equation for torque developed in a DC shunt motor?

7M

(b) What are different types of DC Motors?

7M

UNIT – IV

7.

(a) Derive induced emf equation in a transformer?

7M

(b) What different types of transformers?

7M

(OR)

8.

Explain the working principle and constructional details of three phase Induction Motor?

14M

UNIT-V

9.

What are the different components in switchgear? Explain briefly?

14M

(OR)

10.

Explain the term effect of earthing, its advantages and dis-advantages?

14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Supplementary Examinations of September – 2021
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 Flowchart. Illustrate and explain flowchart symbols and its benefits with an example. 7M
(b) Explain in detail about Software Development Life Cycle with a neat sketch. 7M

(OR)

2. (a) Explain formatted and unformatted I/O statements with its syntax and examples. 14M

UNIT – II

3. (a) Explain in detail about various decision making statements with appropriate syntax and examples. 14M

(OR)

4. (a) Explain in detail about looping statements with its appropriate syntax and example program for each. 14M

UNIT – III

5. (a) Explain in detail about 1-D and 2-D arrays. Write a C program to perform matrix multiplication. 7M
(b) Explain briefly about Array applications. Write a C program to sort the elements in ascending order using bubble (exchange) sort. 7M

(OR)

6. (a) Explain string I/O functions and string handling functions with appropriate syntax and example program for each. 14M

UNIT – IV

7. (a) Explain in detail about Call by value and Call by reference in function with syntax and examples. 10M
(b) Explain briefly about various storage classes available in C. 4M

(OR)

8. (a) Explain how to access the address of variables and how to access a variable through a pointer with examples. 14M

UNIT-V

9. (a) Define structure. Explain copying and comparing structure variables with syntax and example. 7M
(b) Write a C program to create student enrollment details using nested structure. 7M

(OR)

10. (a) Explain in detail about accessing members of structure with syntax and example. 7M
(b) Define Union. Explain declaration and initialization of union with appropriate syntax and example. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Supplementary Examinations of September – 2021
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) Discuss for what values of λ, μ the simultaneous equations $x + y + z = 6$, $x + 2y + 3z = 10$, $x + 2y + \lambda z = \mu$ have i) no solution ii) unique solution iii) an infinite number of solutions. **7 M**
- (b) Using Cayley-Hamilton theorem find the inverse of the Matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$ **7M**

(OR)

2. Reduce the quadratic form $3x^2 + 2y^2 + 3z^2 - 2xy - 2yz$ to the normal form by orthogonal transformation. **14 M**

UNIT - II

3. (a) Test for the convergence of the series $\sum (\sqrt[3]{n^3 + 1} - n)$ **7 M**
- (b) Test for the convergence of the series $\sum \left(1 + \frac{1}{n}\right)^{-n^2}$ **7 M**

(OR)

4. (a) Test for the convergence of the series $\frac{1.2}{3.4.5} + \frac{2.3}{4.5.6} + \frac{3.4}{5.6.7} + \dots$ **7 M**
- (b) Test for the convergence of the series $\sum \left(\frac{1}{(\log(\log n))^n}\right)$ **7 M**

UNIT - III

5. (a) Using Taylor's series, calculate the approximate value of $\sqrt{10}$ to four decimal places. **7 M**
- (b) Find the equation of the circle of curvature at the point $(0,1)$ on the curve $y = x^3 + 2x^2 + x + 1$ **7 M**
- (OR)**
6. (a) Expand $\log_e x$ in powers of $(x-1)$ and hence evaluate $\log 1.1$ correct to 4 decimal places. **7 M**
- (b) Find the radius of curvature at any point on the curve $y = c \cdot \cosh \frac{x}{c}$. **7 M**

UNIT - IV

7. (a) If $u = \frac{yz}{x}, v = \frac{zx}{y}, w = \frac{xy}{z}$ then find $\frac{\partial(u, v, w)}{\partial(x, y, z)}$. **7 M**
- (b) If $u = f(y-z, z-x, x-y)$ then prove that $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = 0$ **7 M**

(OR)

8. Discuss the maximum and minimum of $f(x, y) = x^3 y^2 (1 - x - y)$. **14 M**

UNIT-V

9. (a) Express the integral $\int_0^3 \frac{dx}{\sqrt{9-x^2}}$ in terms of beta function **7 M**
- (b) Show that $\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$ **7 M**

(OR)

10. Find the Half range Cosine Series for $f(x) = x(2-x)$ in $0 \leq x \leq 2$ and hence find the sum of the series $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots$ **14M**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Supplementary Examinations of September – 2021
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) Establish the equation of motion of a simple harmonic oscillator and solve it. Hence derive expressions for its velocity, period and frequency. Write the principle of superposition of waves. 10M
 - (b) A particle executing simple harmonic motion has a maximum displacement A and maximum energy E. Find the displacement at the instant when its kinetic energy is E/2. 4M
- (OR)
2. (a) Find the equation of motion for a damped harmonic oscillator and solve it to obtain the frequency of its oscillation. 7M
 - (b) What are forced oscillations? Derive and solve the differential equation of a driven (forced) harmonic oscillator. 7M

UNIT – II

3. (a) Discuss the important conditions for constructive interference of light. Obtain the conditions for the interference of light reflected by a thin parallel film. 10M
 - (b) Discuss the formation of colours in thin films. 4M
- (OR)
4. (a) Give the theory of a plan diffraction grating of transmission type. 10M
 - (b) There are 15,000 lines per inch in a grating. What is the maximum number of orders obtained by using light of wavelength 6000 Å ? 4M

UNIT – III

5. (a) Distinguish spontaneous and stimulated emission of radiation. Describe the construction and working of a He-Ne laser with neat diagram. 10M
 - (b) Write the applications of lasers. 4M
- (OR)
6. (a) What is population inversion? Explain the significance of Einstein's coefficients. What are various emission mechanisms? 8M
 - (b) Describe the construction and working of a p-n junction semiconductor diode laser. 6M

UNIT – IV

7. (a) Explain the de Broglie concept of matter waves and write the properties of matter waves. Find the velocity of a neutron whose de Broglie wave length is 1.4×10^{-10} m. Given, $h = 6.63 \times 10^{-34}$ J.Sec and mass of neutron is 1.675×10^{-27} kg. 6M
- (b) Derive Schrödinger's time independent wave equation. Write the physical significance of wave function. 8M

(OR)

8. (a) Solve Schrodinger wave equation for a particle in a one dimensional infinite potential well and show that the energy levels are discrete in nature. 10M
- (b) Explain the probability of finding the particle in one dimensional infinite potential well when $n=1,2$ and 3 4M

UNIT-V

9. (a) What are direct and indirect band gap semiconductors? Explain with neat E-k diagram. 6M
 - (b) What are intrinsic and extrinsic semiconductors? Give two examples for each type of semiconductors. Define the position of Fermi-level with neat diagram in each type of semiconductors. Explain the influence of temperature and carrier concentration on the position of Fermi-level. 8M
- (OR)
10. (a) Discuss the Kronig –Penney model for the motion of an electron in a periodic potential. 10M
 - (b) Distinguish between metals, semiconductors and insulators based on band theory. 4M

Q.P. Code: 1822104

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Supplementary Examinations of September – 2021
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 Newton's rings experiment with a neat diagram and obtain the condition for dark and bright fringe diameters. 14M
(OR)
2. (a) Explain Fraunhofer diffraction due to double slit 14M

UNIT – II

3. (a) Explain the characteristics of lasers? 6M
(b) Derive the relation between various Einstein's coefficients? 8M
(OR)
4. (a) Explain the construction and working of He-Ne Laser? 10M
(b) Explain various applications of Lasers? 4M

UNIT – III

5. (a) Describe Kronig-Penny model to understand the behavior of electrons in a varying periodic potential field of a crystal? 14M
(OR)
6. (a) Explain about metals, semiconductors and insulators? 6M
(b) Explain free electron theory? 8M

UNIT – IV

7. (a) Explain Intrinsic and Extrinsic semiconductors? 6M
(b) Explain Drift and Diffusion? 8M
(OR)
8. (a) What is PN junction? and Explain forward and reverse bias? 10M
(b) Explain semiconductor materials of interest for optoelectronic devices? 4M

UNIT-V

9. (a) Explain the significance of Nano materials? 6M
(b) Describe the synthesis of Nano materials by Ball-Milling method? 8M
(OR)
10. (a) Describe the synthesis of Nano materials by Chemical Vapour Deposition method? 8M
(b) Explain various applications of Nano materials? 6M

Q.P. Code: 1823102

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Supplementary Examinations of September – 2021
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) Define doping and explain n-type and p-type doping with examples. 7M
(b) Write the postulates of LCAO. 7M

(OR)

2. Explain crystal field theory and write notes on crystal field splitting of energy levels in octahedral complexes. 14M

UNIT – II

3. (a) Define ionization potential. Write the factors affecting ionization potential. 8M
(b) Write notes on i) atomic size ii) electro negativity. 6M

(OR)

4. (a) Define electron configuration and explain assigning of electrons in orbitals 8M
(b) Write notes on i) effective nuclear charge b) polarisability and orbital energies 6M

UNIT – III

5. (a) Define cell potential and derive Nernst equation. 7M
(b) Define corrosion and explain wet corrosion. 7M

(OR)

6. (a) Write short notes on types of water. 4M
(b) Write short notes on any two boiler troubles. 10M

UNIT – IV

7. What is electronic spectroscopy and explain electronic spectroscopy of atoms and molecules. 14M

(OR)

8. (a) Write a short notes on selection rules 7M
(b) Write short notes on fluorescence & applications of fluorescence in medicine. 7M

UNIT-V

9. (a) Explain Baeyer-villiger reaction. 7M
(b) Write short notes on Clemmensen reduction. 7M

(OR)

10. (a) Write short notes on structural isomers and stereo isomers. 7M
(b) Write short notes on enantiomers and diastereomers 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Supplementary Examinations of September – 2021
SUB: English (CE, EEE & ME)

Time: 3 Hours**Max. Marks: 70**

Answer any FIVE Questions
All questions carry Equal Marks.

1. (a) Define the term 'Suffix'. Write any eight suffixes giving meaning and example word for each suffix. **8M**
- (b) Write any six root words from foreign languages used in English in their direct form and give their meanings. **6M**
2. (a) Write one **Synonym** for each of the words: **7M**
(i) Perceive (ii) Recur (iii) Authorize (iv) Slim (v) Convert (vi) Smart (vii) Inspect
- (b) Write one **Antonym** for each of the words: **7M**
(i) Cheap (ii) Rude (iii) Lift (iv) Risky (v) Dim (vi) Brave (vii) Dense
3. (a) What parameters have to be kept in mind while drafting a paragraph? **7M**
- (b) Write a paragraph on: Your favorite politician **7M**
4. (a) Interchange of Part of Speech: **7M**
(i) Break (change to 'adjective' form) (ii) Active (change to 'verb' form)
(iii) Clear (change to 'adverb' form) (iv) Locate (change to 'noun' form)
(v) Metal (change to 'adjective' form) (vi) Pure (change to 'verb' form)
(vii) Enquire (change to 'noun' form)
- (b) (i) China has made an atom bomb. (Convert to passive voice) **7M**
(ii) All the huts had been destroyed by the fire. (Convert to active voice)
(iii) They will attend the conference. (Convert to passive voice)
(iv) I have always been helped by him. (Convert to active voice)
(v) Ajit said that Mohit played cricket. (Change to Direct Speech)
(vi) Mother said, "The train is late." (Change to Indirect Speech)
(vii) The Major said, "March forward my soldiers." (Change to Indirect Speech)
5. Give the meaning and make a sentence of your own for each of the **idioms** given below. **7X2=14M**
(i) Bell the cat. (ii) Add insult to injury. (iii) Hit the jackpot (iv) Black sheep.
(v) Blessing in disguise (vi) Save one's face (vii) Build castles in the air
6. (a) Use appropriate **prepositions**: **6M**
(i) Ralph died _____ cancer.
(ii) Water is split _____ the floor.
(iii) What is the time _____ your watch?
(iv) Soldiers die _____ their country.
(v) She died _____ cancer.
(vi) Meena congratulated Kamala _____ her success.
- (b) (i) Stephan is _____ European. (Supply suitable article) **8M**
(ii) Ram has _____ M.B.A. degree. (Supply suitable article)
(iii) Raj navigates the ship. (Change to 'past perfect' tense)
(iv) She rode on the horse. (Change to 'future perfect continuous' tense)
(v) He confessed his crime. (Change to 'Complex Sentence')
(vi) You cannot succeed without honesty. (Change to 'Complex Sentence')
(vii) I _____ my car key last month. (Had lost / lost)
(i) I blame _____ for it. (Use suitable 'reflexive pronoun')
7. Write an essay on "undergraduate Engineering education in India." **14M**

8. (a) **Precis writing:** 7M
Condense the following passage retaining the main idea and using a minimum number of words:
When one does not really understand the true purpose of life, one is not in a position to really figure out how to focus on the actions to be carried out. That's what happens to most of us. we live and keep involving ourselves in our actions which may not necessarily define us. Such a life is like a aimless drift in a dark confusing Ocean where you sail and sail and still don't know where to shore up.
- (b) **Read the following passage and answer the questions:** 7M
At one time in the history of India, most women knew very well how to bring up their infants and they lived a perfectly healthy life, free from diseases. The overall standard of women and children in the country was much better than that of other civilizations of that period. But ever since India was exposed to frequent foreign invasions from foreign nations, the life was unsafe and property unprotected, the people were forced to congregate in towns in such a compact way that it led to awful insanitation and diseases. The traditional knowledge of domestic and personal health and hygiene was ignored. Women were confined indoors for fear of insults and a train of social and unhealthy dangers followed all round. It is a problem how now we can restore the original conditions of healthy and happy life in India. This is a socio-economic problem which needs to be given priority to bring back the original culture and restore welfare of women and children in India.
- Questions**
- (i) What was the main cause of poor health conditions of women in India?
 - (ii) What question has the writer posed before the readers?
 - (iii) Why did life become unsafe and property unprotected?
 - (iv) Why were the women confined indoors?
 - (v) When were the women leading a perfectly healthy life?
 - (vi) What does the word 'congregate' mean in the passage?
 - (vii) How are foreign invasions responsible for poor health conditions?