

| Course Code: B20HS1101 | | | | | | | |
|---|----|--|----------------|------|----|-----|----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | R 20 | | | |
| I B. Tech I Semester –MODEL PAPER | | | | | | | |
| ENGLISH | | | | | | | |
| Common to AIDS,CE,CSE,ECE,EEE,IT&ME | | | | | | | |
| Time : 3Hrs. | | | Max. Marks: 70 | | | | |
| Answer any one Question from EACH UNIT. | | | | | | | |
| All questions carry equal marks. | | | | | | | |
| | | | | M | CO | KL | |
| UNIT-I | | | | | | | |
| 1 | a. | Compose an essay on “A Drawer full of happiness”. | | | 7 | 2 | K3 |
| | b. | Identify & Write suitable verb forms for the following. i) He _____ (work) in the college when his brother studied his engineering. ii) He _____ (finish) his task before his friend visited him. iii) As soon as he _____ (get) the telegram, at once he started. iv) It is high time she _____ (do) her project.. v) The book _____ (comprise) five chapters. vi) The photo of my grandfather _____ (hang) on the wall. vii) Neither team _____ (score) any goal. | | | 7 | 5 | K3 |
| OR | | | | | | | |
| 2 | a. | Compose an essay on any ONE of the following. i) Pros and cons of Social Networking Sites ii) The essence of education | | | 7 | 2 | K3 |
| | b. | Read the following passage and answer the questions that follow: Liquids are practically incompressible. Unlike gases but like solids, a liquid does not change much in volume when the pressure on it is changed, even when the pressures of thousands of atmospheres are involved. The kinetic theory accounts for this saying that the amount of free space between the molecules of a liquid has been reduced almost to a minimum. Any attempt to compress the liquid meets with resistance as the electron cloud of one molecule repels the electron cloud of the adjacent molecule. Liquids diffuse slowly, but in gases it is more rapid. It occurs because molecules have kinetic energy and move from one place to another .In a liquid ,molecules do not move very far before they collide with neighbouring molecules. i) What is the nature of the liquids? ii) What does kinetic theory say about the incompressible nature of liquids? iii) What are the different kinds of matter? iv) Give the meaning for ‘diffusion’? v) Why diffusion is more rapid in gases? vi) Give the antonym for ‘kinetic’. vii) Mention a suitable title. | | | 7 | 2,5 | K3 |

| UNIT-II | | | | | |
|-----------------|-----------|--|---|---|----|
| 3 | a. | Compose an essay on the relevance of Nehru's letter to Indira to the present context. | 7 | 2 | K3 |
| | b. | Write antonyms and construct sentences for any SEVEN of the following words . i) procreate ii) hectic iii) reckon iv) beguile v) opulent vi) suffuse vii) astute viii) mandatory | 7 | 5 | K3 |
| OR | | | | | |
| 4 | a. | Formulate a precis for the following passage. Most of us use the products of science – railways, aeroplanes, electricity, wireless and thousands of others – without thinking how they came into existence. We take them for granted, as if we were entitled to them as a matter of right. We are very proud of the fact that we live in an advanced age and are ourselves very advanced. Now, there is no doubt that our age is very different from previous ages and I think it is perfectly correct to say that is far more advanced. But it is a different thing from saying that we, as individuals or groups, are more advanced. It would be the height of absurdity to say that because an engine driver can run an engine and Plato or Socrates could not, the engine driver is more advanced than, or is superior to, Plato or Socrates. But it would be perfectly correct to say that the engine itself is a more advanced method of locomotion than Plato's chariot was. | 7 | 2 | K3 |
| | b. | Write meanings and bring out the difference in usage for any FOUR of the following homonyms. i) Affect/Effect ii) Continuous/ Continual iii) Veracious/Voracious iv) Facilitate/Felicitate iv) Apposite/Opposite v) Intelligent/ Intelligible | 7 | 5 | K3 |
| UNIT-III | | | | | |
| 5 | a. | Compose an essay on "Stephen Hawking – Positivity 'Benchmark'". | 7 | 2 | K3 |
| | b. | Draft a letter to the educational consultancy asking about the information regarding the post-graduation and research programmes in foreign universities. | 7 | 4 | K3 |
| OR | | | | | |
| 6 | a. | Write an E-mail to the manufacturer complaining about the computer that you bought recently. | 7 | 4 | K3 |
| | b. | Draft a resume and covering letter for the post of a software engineer. | 7 | 4 | K3 |
| UNIT-IV | | | | | |
| 7 | a. | Summarize the essay "Liking a Tree, Unbowed"? | 7 | 2 | K3 |
| | b. | Give the meaning and write sentences of any SEVEN of the following FOREIGN PHRASES. i) ab initio ii) a la mode iii) siesta iv) amour proper v) ad hoc vi) Alma Mater vii) alter ego viii) bonafide | 7 | 5 | K3 |
| OR | | | | | |
| 8 | a. | Write a pamphlet on book exhibition/ tour. | 7 | 2 | K3 |
| | b. | Construct Sentences through the transformation of the following sentences as indicated. | 7 | 5 | K3 |

| | | | | | |
|---------------|-----------|--|---|---|----|
| | | <p>i. They painted the house green. (Add a question tag)</p> <p>ii. Do it. (Change the voice)</p> <p>iii) He said to the boy, “What are you doing here.” (Convert it into Indirect Speech)</p> <p>iv) My father said that Honesty is the best policy. (Convert it into direct Speech)</p> <p>v) They were very poor. They had insufficient food for themselves. They invited the strangers to dinner. (Change it into Complex)</p> <p>vi) The old man being weak could not walk properly. (Change it into Compound)</p> <p>vii). Shakespeare is the most famous of all writers in English. (Change it into positive degree)</p> | | | |
| UNIT-V | | | | | |
| 9 | a. | Elaborate the message which the author communicates to the readers through the lesson “Stay Hungry-Stay Foolish”. | 7 | 2 | K3 |
| | b. | <p>Correct and Re-construct any SEVEN of the following Sentences.</p> <p>i) One must use his best efforts if he wishes to succeed.</p> <p>ii) Since he came, we are happy.</p> <p>iii) I could hardly believe in my eyes.</p> <p>iv) Suppose, if you arrive late, you will miss the show.</p> <p>v) Neither Jack is intelligent nor hardworking.</p> <p>vi) Hardly the sun had risen when we set out.</p> <p>vii) It is high time she improves her behaviour.</p> <p>viii) She gave me many informations.</p> | 7 | 5 | K3 |
| OR | | | | | |
| 10 | a. | Compile a report to the editor about the problem of brain drain in India | 7 | 4 | K3 |
| | b. | <p>Fill in the blanks with the appropriate choices.</p> <p>i) The film Titanic was promoted with all the usual _____</p> <p>a) hyperbole b) dialect c) taboo d) aesthetic</p> <p>ii) The schedule of a few planes was _____ due to heavy smog.</p> <p>a) prohibited b) abated c) impeded d) bolstered</p> <p>iii) Einstein had never bothered by the flood of _____ from his fellow critics.</p> <p>a) recantation b) castigation c) vituperation d) skepticism</p> <p>iv) The field had been _____ by heavy downpour last night.</p> <p>a) tirade b) fluctuated c) mixed d) saturated</p> <p>v) Modi is good at giving _____ speeches.</p> <p>a) extempore b) prepared c) epilogue d) long</p> <p>vi) The manuscript was reproduced in _____ .</p> <p>a) facsimile b) archives c) cache d) vacillation</p> <p>vii) Examine the report carefully before you _____ it publicly in front of the press and media.</p> <p>a) rescind b) repudiate c) revere d) redress</p> | 7 | 5 | K3 |

| Course Code: B20BS1101 | | | | |
|---|---|------------------|-----|----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | R20 | |
| I B.Tech I Semester –MODEL PAPER | | | | |
| MATHEMATICS – I | | | | |
| (LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS) | | | | |
| Common to AIDS, CE, CSE, ECE, EEE, IT & ME | | | | |
| TIME: 3 Hrs. | | Max. Marks: 70 M | | |
| Answer any One Question from Each Unit | | | | |
| All questions carry equal marks | | | | |
| UNIT-I | | M | CO | KL |
| 1.a) | Solve the system of equations $20x + y - 2z = 17$, $3x + 20y - z = -18$, $2x - 3y + 20z = 25$ by Gauss –Siedel method. | 7 | CO1 | K3 |
| b) | Investigate the values of λ and μ so that the equations $2x + 3y + 5z = 9$; $7x + 3y - 2z = 8$; $2x + 3y + \lambda z = \mu$; have (i) no solution (ii) unique solution (iii) infinite number of solutions. | 7 | CO1 | K3 |
| (OR) | | | | |
| 2. a) | Solve the system of equations $10x + y+z =12$, $2x+10y+z =13$, $2x+2y+10z =14$ by Gauss- elimination method. | 7 | CO1 | K3 |
| b) | Define rank and determine the rank of the matrix A by reducing it to its normal form where A is: $A = \begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$ | 7 | CO1 | K3 |
| UNIT-II | | | | |
| 3.a) | Verify Cayley-Hamilton theorem and use the theorem to determine the inverse of the matrix $A = \begin{bmatrix} 1 & 0 & 3 \\ 2 & 1 & -1 \\ 1 & -1 & 1 \end{bmatrix}$ | 7 | CO2 | K3 |
| b) | Reduce the quadratic form $2x^2 + 2y^2 + 2z^2 - 2xy - 2yz - 2zx$ to canonical form by the use of an orthogonal transformation. | 7 | CO2 | K3 |
| (OR) | | | | |
| 4. a) | Determine the Eigen values and the corresponding Eigen vectors of the matrix $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$ | 7 | CO2 | K3 |
| b) | If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$, use Cayley-Hamilton theorem to determine the value of $2A^5 - 3A^4 + A^2 - 4I$. Also determine the inverse of A. | 7 | CO2 | K3 |

| UNIT-III | | | | |
|-----------------|--|---|-----|----|
| 5.a) | Solve $\frac{dy}{dx} + (\tan x)y = (\sec x)y^3$. | 7 | CO3 | K3 |
| b) | Solve $(y^4 + 2y)dx + (xy^3 + 2y^4 - 4x)dy = 0$. | 7 | CO3 | K3 |
| OR | | | | |
| 6. a) | Determine the orthogonal trajectories of the family of parabolas $ay^2 = x^3$. | 7 | CO4 | K3 |
| b) | A body originally at $80^{\circ}C$, cools down to $60^{\circ}C$ in 20 minutes, the temperature of air being $40^{\circ}C$. Determine the temperature of the body after 40 minutes from the original? | 7 | CO4 | K3 |
| UNIT-IV | | | | |
| 7.a) | Solve $(D^3 - D)y = 2x + 1 + 4 \cos x$. | 7 | CO5 | K3 |
| b) | Solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = e^x \log x$ by the method of variation of parameters. | 7 | CO5 | K3 |
| OR | | | | |
| 8. a) | Solve $(D^2 + 3D + 2)y = e^{e^x}$. | 7 | CO5 | K3 |
| b) | Use method of variation of parameters to solve the equation $\frac{d^2y}{dx^2} + y = \operatorname{cosec} x$. | 7 | CO5 | K3 |
| UNIT-V | | | | |
| 9.a) | Determine $L\{t \cos at\}$ and $L\left\{\int_0^t e^{-t} \cos t dt\right\}$. | 7 | CO6 | K3 |
| b) | Using convolution theorem evaluate $L^{-1}\left\{\frac{1}{(s+a)(s+b)}\right\}$. | 7 | CO6 | K3 |
| OR | | | | |
| 10. a) | Determine $L^{-1}\left\{\frac{5s+3}{(s-1)(s^2+2s+5)}\right\}$. | 7 | CO6 | K3 |
| b) | Solve $\frac{d^2y}{dt^2} + 4\frac{dy}{dt} + 3y = e^{-t}$, $y(0) = y'(0) = 1$ by using Laplace transforms. | 7 | CO6 | K3 |

APPLIED CHEMISTRY

Common to CSE,ECE & IT

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

Answer any one Question from Each Unit

All questions carry equal Marks

| | | | M | CO | KL |
|-----------------|----|--|---|-----|----|
| UNIT-I | | | | | |
| 1 | a. | Explain the mechanism of free radical Polymerization reaction with a suitable example. | 7 | CO1 | K2 |
| | b. | Distinguish between thermoplastic and thermosetting resins | 7 | CO1 | K3 |
| OR | | | | | |
| 2 | a. | What are conducting Polymers? Discuss the applications of conducting Polymers. | 7 | CO1 | K2 |
| | b. | Write notes on Bu Na – S and Bu Na – N. | 7 | CO1 | K2 |
| UNIT-II | | | | | |
| 3 | a. | Explain the Proximate analysis of coal and give its significance. | 7 | CO3 | K2 |
| | b. | Explain Photovoltaic cell with neat diagram. | 7 | CO3 | K2 |
| OR | | | | | |
| 4 | a. | Explain the fractional distillation of crude oil | 7 | CO3 | K2 |
| | b. | How synthetic Petrol can be prepared by Berguis Process. | 7 | CO3 | K2 |
| UNIT-III | | | | | |
| 5 | a. | Explain the mechanism of electrochemical theory of corrosion with neat diagram | 7 | CO2 | K2 |
| | b. | Describe briefly about cathodic Protection. | 7 | CO2 | K3 |
| OR | | | | | |
| 6 | a. | Explain Hydrogen – Oxygen fuel cell with neat cell diagram | 7 | CO4 | K2 |
| | b. | Discuss about Lithium batteries | 7 | CO4 | K2 |
| UNIT-IV | | | | | |
| 7 | a. | What is hardness? How it is determined by EDTA method? Explain | 7 | CO2 | K2 |
| | b. | Describe with equations how water can be softened using Lime & Soda Process | 7 | CO2 | K2 |
| OR | | | | | |
| 8 | a. | Discuss various sterilizing methods used in municipal water treatment | 7 | CO2 | K2 |
| | b. | Illustrate the reverse osmosis Process with a neat diagram | 7 | CO2 | K2 |
| UNIT-V | | | | | |
| 9 | a. | Discuss chemistry involved in setting and hardening of cement? | 7 | CO4 | K2 |
| | b. | What are refractories? Discuss the classification of refractories. | 7 | CO4 | K2 |
| OR | | | | | |
| 10 | a. | Write the engineering applications of Liquid Crystals. | 7 | CO3 | K2 |
| | b. | Explain the stoichiometric defects in crystals. | 7 | CO3 | K2 |

| Course Code: B20 CS 1101 | | | | | | |
|--|----|--|----------------------|----------|-------------|-----------|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | | R 20 | |
| I B. Tech I Semester MODEL QUESTION PAPER | | | | | | |
| PROGRAMMING FOR PROBLEM SOLVING USING C | | | | | | |
| (Common to AIDS, CSE , ECE & IT) | | | | | | |
| Time: 3 Hrs. | | | Max. Marks:70 | | | |
| Answer any one Question from Each Unit | | | | | | |
| All questions carry equal Marks | | | | | | |
| | | | | M | CO | KL |
| UNIT-I | | | | | | |
| 1 | a. | What do you mean C Variable, C Constants? Explain in detail | 7M | CO1 | K1 | |
| | b. | Explain Expressions Precedence and Associativity in detail | 7M | CO1 | K2 | |
| OR | | | | | | |
| 2 | a. | Explain types of storage classes in C | 7M | CO1 | K2 | |
| | b. | Write the basic structure of C program and explain each and every step | 7M | CO1 | K2 | |
| UNIT-II | | | | | | |
| 3 | a. | Explain logical, bitwise operators with examples | 7M | CO2 | K2 | |
| | b. | Differentiate two-way selection and multi-way selection | 7M | CO2 | K2 | |
| OR | | | | | | |
| 4 | a. | What is the difference between Pre-test loop and Post-test Loop with an example | 7M | CO2 | K2 | |
| | b. | Discuss Event and Counter controlled loops | 7M | CO2 | K2 | |
| UNIT-III | | | | | | |
| 5 | a. | What is an Array? Define and initialize 1-D, 2-D Arrays | 7M | CO3 | K1 | |
| | b. | Write a program to evaluate the average of values in an Array | 7M | CO3 | K3 | |
| OR | | | | | | |
| 6 | a. | Explain declaration and initialization of Array of Strings | 7M | CO3 | K2 | |
| | b. | What is an Union? List the difference between Structures and Unions | 7M | CO3 | K1 | |
| UNIT-IV | | | | | | |
| 7 | a. | Explain the concept of Array of Pointers with example | 7M | CO4 | K2 | |
| | b. | With proper example explain different arithmetic operators on Pointers | 7M | CO4 | K2 | |
| OR | | | | | | |
| 8 | a. | Explain L and R values in C Language and how are they used in C Language | 7M | CO4 | K2 | |
| | b. | Discuss various Processor Commands | 7M | CO4 | K2 | |
| UNIT-V | | | | | | |
| 9 | a. | How to pass Array to a Function in C | 7M | CO5 | K2 | |
| | b. | Discuss the Types of Functions in C | 7M | CO5 | K2 | |
| OR | | | | | | |
| 10 | a. | What is Stream? Describe two different methods of creating a Stream-Oriented data file | 7M | CO5 | K1 | |
| | b. | Write a program to Copy contents from one File to another File | 7M | CO5 | K1 | |

| Course Code: B20 CS 1102 | | | | | |
|--|-----|---|----------------------|-----------|-------------|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | | R 20 |
| I B. Tech I Semester MODEL QUESTION PAPER | | | | | |
| COMPUTER FUNDAMENTALS & DIGITAL LOGIC | | | | | |
| For CSE | | | | | |
| Time: 3 Hrs. | | | Max. Marks:70 | | |
| Answer any one Question from Each Unit | | | | | |
| All questions carry equal Marks | | | | | |
| | | | CO | KL | M |
| UNIT – I | | | | | |
| 1. | a). | Draw a block diagram of computer system hardware | CO1 | K2, K5 | 7 |
| | b). | Analyse about various input and output devices | CO1 | K3 | 7 |
| OR | | | | | |
| 2. | a). | Explain about memory classification | CO1 | K2 | 7 |
| | b). | Define IO-ports and write about the input and output devices with examples. | CO1 | K1 | 7 |
| UNIT – II | | | | | |
| 3. | | Discuss about basic theorems and properties of Boolean Algebra | CO2 | K6 | 14 |
| OR | | | | | |
| 4. | a). | Discuss Different types of number base conversions | CO2 | K6 | 7 |
| | b). | Explain signed binary numbers | CO2 | K2 | 7 |
| UNIT – III | | | | | |
| 5. | | Simplify the following using K- map and implement the same using NAND gates. $Y (A, B, C) = \sum (0, 2, 4, 5, 6, 7)$ | CO3 | K2 | 14 |
| OR | | | | | |
| 6. | a). | Write about product of sum with example | CO3 | K2 | 7 |
| | b). | Determine the characteristics of K-variable map | CO3 | K5 | 7 |
| UNIT – IV | | | | | |
| 7. | a). | Demonstrate the different types of binary arithmetic operations | CO4 | K2 | 7 |
| | b). | Explain the characteristics of decoder with example | CO4 | K2 | 7 |
| OR | | | | | |
| 8. | a). | Discuss about multiplexer | CO4 | K6 | 7 |
| | b). | Explain binary comparator | CO4 | K5 | 7 |
| UNIT – V | | | | | |
| 9. | | Write short notes on JK,RS,T,D-flops | CO5 | K2 | 14 |
| OR | | | | | |
| 10 | b). | Discuss about conversion of Flip Flops | CO5 | K6 | 7 |

Answer any One Question from Each Unit

All questions carry equal marks

| UNIT-I | | M | CO | KL |
|-----------------|--|---|-----|----|
| 1.a) | Determine the Fourier series for the function $f(t) = \begin{cases} -1, & -\pi < t < -\pi/2 \\ 0, & -\pi/2 < t < \pi/2 \\ 1, & \pi/2 < t < \pi \end{cases}$ | 7 | CO1 | K3 |
| b) | Determine Fourier series of the function $f(x) = 2x - x^2$ in $(0, 3)$ and hence deduce that $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots = \frac{\pi}{12}$. | 7 | CO1 | K3 |
| OR | | | | |
| 2. a) | Determine Fourier series for the function $f(x)$ given by $f(x) = \begin{cases} 1 + \frac{2x}{\pi}, & \text{if } -\pi \leq x \leq 0 \\ 1 - \frac{2x}{\pi}, & \text{if } 0 \leq x \leq \pi \end{cases}$ and deduce that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \dots = \frac{\pi^2}{8}$. | 7 | CO1 | K3 |
| b) | Determine the Half – Range cosine series for the function $f(x) = x^2$ in the range $0 \leq x \leq \pi$. | 7 | CO1 | K3 |
| UNIT-II | | | | |
| 3.a) | Using the Fourier Sine Transform of e^{-ax} ($a > 0$), evaluate $\int_0^{\infty} \frac{x \sin kx}{a^2 + x^2} dx$. | 7 | CO2 | K3 |
| b) | Using Fourier integral representation, establish that $\int_0^{\infty} \frac{\omega \sin \omega x}{1 + \omega^2} d\omega = \frac{\pi}{2} e^{-x}, x > 0$. | 7 | CO2 | K3 |
| OR | | | | |
| 4. a) | Determine the inverse Fourier sine transform $f(x)$ of $F_s(p) = \frac{p}{1+p^2}$. | 7 | CO2 | K3 |
| b) | Using Parseval's Identity, establish that $\int_0^{\infty} \frac{x^2}{(1+x^2)^2} dx = \frac{\pi}{4}$. | 7 | CO2 | K3 |
| UNIT-III | | | | |
| 5.a) | If $U = \tan^{-1} \frac{x^3+y^3}{x-y}$ and $x U_x + y U_y = \sin 2U$, establish that $x^2 U_{xx} + 2xy U_{xy} + y^2 U_{yy} = 2 \cos 3U \sin U$. | 7 | CO3 | K3 |
| b) | If $u = x^2 - 2y^2, v = 2x^2 - y^2$ where $x = r \cos \theta, y = r \sin \theta$ then establish that $\frac{\partial(u,v)}{\partial(r,\theta)} = 6 r^3 \sin 2\theta$. | 7 | CO3 | K3 |
| OR | | | | |

| | | | | |
|----------------|---|---|-----|----|
| 6. a) | Develop $x^2y + 3y - 2$ in a Taylor series in powers of $(x - 1)$ and $(y + 2)$ using Taylor's theorem. | 7 | CO4 | K3 |
| b) | By using the method of differentiation under the integral sign establish that $\int_0^\infty \frac{\tan^{-1}(ax)}{x(1+x^2)} dx = \frac{\pi}{2} \log(1+a)$, $a \geq 0$. | 7 | CO4 | K3 |
| UNIT-IV | | | | |
| 7. a) | Solve $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$. | 7 | CO5 | K3 |
| b) | solve $(D^2 - DD' - 2D'^2)z = (y-1)e^x$. | 7 | CO5 | K3 |
| OR | | | | |
| 8. a) | Solve $x(y-z)p + y(z-x)q = z(x-y)$. | 7 | CO5 | K3 |
| b) | solve $(D + D' - 1)(D + 2D' - 3)z = 3x + 6y + 4$. | 7 | CO5 | K3 |
| UNIT-V | | | | |
| 9.a) | Determine the solution of $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} = 0$ by the method of separation of variables. | 7 | CO6 | K3 |
| b) | A tightly stretched elastic string of length L , fixed at its end points is initially in a position given by $u(x, 0) = u_0 \sin^3 \frac{\pi x}{L}$. If it is released from rest, determine the displacement at any subsequent time. | 7 | CO6 | K3 |
| OR | | | | |
| 10.a) | Determine the solution of $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = 0$ by the method of separation of variables. | 7 | CO6 | K3 |
| b) | A bar of conducting material of length π units is initially kept at a temperature $\sin x$. Determine the temperature at any subsequent time if the ends of the bar are held at zero temperature. | 7 | CO6 | K3 |

Course Code: B20BS1202

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

R 20

I B. Tech II Semester - MODEL QUESTION PAPER

APPLIED PHYSICS

(Common to CSE, ECE & IT)

Time: 3 Hrs.

Max. Marks: 70

Answer any one Question from Each Unit

All questions carry equal Marks

| | M | CO | KL |
|--|---|----|----|
|--|---|----|----|

UNIT-I

| | | | | | |
|---|----|---|---|---|---|
| 1 | a. | Explain the principle of Superposition and discuss the conditions for maxima and minima of intensity. | 6 | 1 | 2 |
| | b. | How the Newton's Rings are formed and deduce an expression for the wave length of light used. | 8 | 1 | 3 |

OR

| | | | | | |
|---|----|---|---|---|---|
| 2 | a. | Distinguish the different types of diffractions of light. | 6 | 1 | 2 |
| | b. | Give qualitative and quantitative analysis of Fraunhofer diffraction at a single slit | 8 | 1 | 3 |

UNIT-II

| | | | | | |
|---|----|--|---|---|---|
| 3 | a. | Define polarization and explain the different types of polarization possible in a dielectric | 6 | 2 | 2 |
| | b. | Deduce the Clausius Mosottirelation and its significance in dielectrics. | 8 | 2 | 3 |

OR

| | | | | | |
|---|----|--|---|---|---|
| 4 | a. | Define Magnetic susceptibility and give a classification of magnetic materials. | 6 | 2 | 1 |
| | b. | Describe the Hysteresis exhibited by Ferromagnetic materials and explain its using a suitable theory | 8 | 2 | 3 |

UNIT-III

| | | | | | |
|---|----|---|---|---|---|
| 5 | a. | Give the selection procedure of the active medium of laser device. | 6 | 3 | 2 |
| | b. | With suitable diagrams, discuss the working principle, design and working of He – Ne laser system | 8 | 3 | 3 |

OR

| | | | | | |
|---|----|---|---|---|---|
| 6 | a. | What is the significance of Numerical Aperture of an optical fiber and obtain an expression for it. | 8 | 3 | 2 |
| | b. | Discuss the sensor applications of optical fibers. | 6 | 3 | 3 |

UNIT-IV

| | | | | | |
|---|----|---|---|---|---|
| 7 | a. | What is an intrinsic semiconductor and obtain an expression for the density of carriers. | 8 | 4 | 3 |
| | b. | Distinguish between direct and indirect band gap semiconductors and mention their applications. | 6 | 4 | 2 |

OR

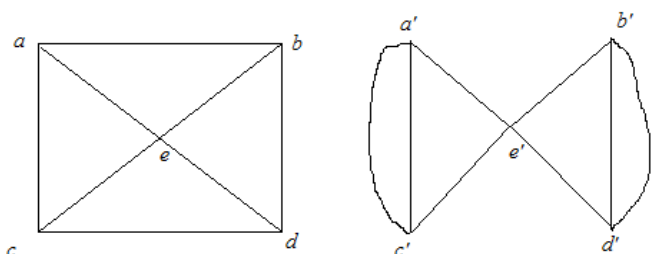
| | | | | | |
|---|----|--|---|---|---|
| 8 | a. | Discuss the Hall Effect in detail and explain its significance. | 8 | 4 | 3 |
| | b. | Distinguish between drift and diffusion current in semiconductors. | 6 | 4 | 2 |

| UNIT-V | | | | | |
|---------------|----|---|----|---|---|
| 9 | a. | Explaining Magnetostriction effect, describe how the ultrasonics can be produced. | 8 | 5 | 3 |
| | b. | Mention the applications of ultrasonics. | 6 | 5 | 1 |
| OR | | | | | |
| 10 | a. | How the nano materials can be produced by sol – gel method. | 6. | 5 | 3 |
| | b. | Write about Carbon Nanotubes | 4 | 5 | 2 |
| | C. | Discuss some important applications of nanomaterials. | 4 | 5 | 1 |

Answer any one Question from Each Unit

All questions carry equal Marks

| Q.No. | Questions | M | CO | KL |
|-----------------|---|---|-----|----|
| UNIT-I | | | | |
| 1.a) | Establish that $\{((p \vee q) \rightarrow r) \wedge (\neg p)\} \rightarrow (q \rightarrow r)$ is a tautology | 7 | CO1 | K3 |
| b) | Establish that the following argument is valid by using the rules of inference If Clifton does not live in France, then he does not speak French. Clifton does not drive a Datsun If Clifton lives in France, then he rides a bicycle Either Clifton speaks French, or he drives a Datsun Hence, Clifton rides a bicycle | 7 | CO1 | K3 |
| (OR) | | | | |
| 2.a) | Verify that the following argument is valid by using the rules of inference, quantifiers. Babies are illogical. Nobody is despised who can manage a crocodile. Illogical people are despised. Hence, babies cannot manage crocodiles. | 7 | CO1 | K3 |
| b) | Determine the PDNF and PCNF of $p \vee \neg q$ | 7 | CO1 | K3 |
| UNIT-II | | | | |
| 3.a) | Determine the number of ways of arranging 6 boys and 6 girls in a row. Also determine the number of arrangements in which i) All girls will be together. ii) No two girls will be together. iii) Boys and girls come alternatively. | 7 | CO2 | K3 |
| b) | i) Determine the term independent of x in the expansion of $(x^2 + \frac{1}{x})^{12}$ ii) Determine the coefficient of $x^5 y^{10} z^5 w^5$ in the expansion $(x + 7y + 3z + w)^{25}$ | 7 | CO2 | K3 |
| (OR) | | | | |
| 4.a) | A cricket team of 11 is to be selected out of 14 players of whom 5 are bowlers. Determine the number of ways in which this can be done so as to include at least 3 bowlers. | 7 | CO2 | K3 |
| b) | Determine the number of integers between 1 and 250 which are divisible by any of the integers 2, 3, 5 or 7. | 7 | CO2 | K3 |
| UNIT-III | | | | |
| 5.a) | Let R denote a relation on the set of ordered pairs of positive integers such that $(x, y)R(u, v)$ if and only if $xv = yu$. Then establish that 'R' is an | 7 | CO3 | K3 |

| | | | | |
|----------------|--|---|-----|----|
| | equivalence relation. | | | |
| b) | Define Hasse diagram. Draw the Hasse diagram for the Poset $(P(S), \subseteq)$ where $S = \{1,2,3\}$ | 7 | CO3 | K3 |
| (OR) | | | | |
| 6.a) | Establish that a Lattice 'L' is distributive iff $\forall x, y, z \in L (x * y) \oplus (y * z) \oplus (z * x) \equiv (x \oplus y) * (y \oplus z) * (z \oplus x)$ | 7 | CO4 | K3 |
| b) | Consider the Boolean polynomial $p(x, y, z) = x * (y \oplus z')$. If $B = \{0,1\}$, compute the truth table of the function $f: B_3 \rightarrow B$ defined by p . Also draw logical diagram. | 7 | CO4 | K3 |
| UNIT-IV | | | | |
| 7.a) | Determine the number of integral solutions for the equation $x_1 + x_2 + x_3 + x_4 + x_5 = 20$ where $x_1 \geq 3, x_2 \geq 2, x_3 \geq 4, x_4 \geq 6$ and $x_5 \geq 0$. | 7 | CO5 | K3 |
| b) | Solve the recurrence relation $S_n - 7S_{n-1} + 10S_{n-2} = 7 \cdot 3^n$ for $n \geq 2$. | 7 | CO5 | K3 |
| (OR) | | | | |
| 8.a) | Determine the coefficient of x^{14} in $(1+x+x^2+x^3)^{10}$ | 7 | CO5 | K3 |
| b) | Solve the recurrence relation $a_n - 5a_{n-1} + 6a_{n-2} = 0, n \geq 2$ by using generating functions. | 7 | CO5 | K3 |
| UNIT-V | | | | |
| 9.a) | Define isomorphism of graphs. Examine whether the following graphs are isomorphic or not.  | 7 | CO6 | K3 |
| b) | State and Prove Euler's formula for planar graphs. | 7 | CO6 | K3 |
| (OR) | | | | |
| 10.a) | Establish that a tree with 'n' elements has exactly 'n-1' edges. | 7 | CO6 | K3 |
| b) | Explain Kruskal's algorithm for minimal spanning tree with a suitable example. | 7 | CO6 | K3 |

| Course Code: B20CS1202 | | | | | | |
|--|----|--|----------------------|-------------|----|----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | R 20 | | |
| I B. Tech I Semester Regular Examinations | | | | | | |
| COMPUTER ORGANIZATION | | | | | | |
| (For CSE) | | | | | | |
| Time: 3 Hrs. | | | Max. Marks:70 | | | |
| Answer any one Question from Each Unit | | | | | | |
| All questions carry equal Marks | | | | | | |
| UNIT-I | | | | M | CO | KL |
| 1 | a. | Differentiate between Von Neumann and Harvard Architecture | 7M | CO1 | K4 | |
| | b. | Explain different arithmetic operations on floating point numbers | 7M | CO1 | K2 | |
| OR | | | | | | |
| 2 | a. | Discuss three representations of Signed integers with suitable examples. | 7M | CO1 | K2 | |
| | b. | Describe the different types of computers. | 7M | CO1 | K2 | |
| UNIT-II | | | | | | |
| 3 | a. | Explain about the Instruction cycle. | 7M | CO1 | K2 | |
| | b. | Explain various types of interrupts in detail. | 7M | CO1 | K2 | |
| OR | | | | | | |
| 4 | a. | Explain in detail about timing and control | 7M | CO2 | K2 | |
| | b. | Illustrate the micro-programmed control unit. | 7M | CO2 | K2 | |
| UNIT-III | | | | | | |
| 5 | a. | Write a program to evaluate the arithmetic statement using different instruction formats $Y=(e + f) * (g - h)$ | 7M | CO1 | K3 | |
| | b. | What do you mean by addressing mode? Explain the following addressing modes with examples. i) Index addressing mode ii) Relative addressing mode | 7M | CO1 | K2 | |
| OR | | | | | | |
| 6 | a. | Explain general register organization | 7M | CO2 | K2 | |
| | b. | Explain RISC with an example | 7M | CO2 | K2 | |
| UNIT-IV | | | | | | |
| 7 | a. | What is the need of cache memory? Discuss any two mapping techniques used in cache memory. | 7M | CO2 | K2 | |
| | b. | Draw a neat block diagram of memory hierarchy in a computer system. Compare the parameters size, speed and cost per bit in the hierarchy. | 7M | CO2 | K4 | |
| OR | | | | | | |
| 8 | a. | With a neat sketch explain the working principle of DMA | 7M | CO2 | K2 | |
| | b. | Discuss about handshaking technique in asynchronous data transfer | 7M | CO2 | K2 | |
| UNIT-V | | | | | | |
| 9 | a. | What is multiprocessor system? Explain the advantages of multi processors over uniprocessors | 7M | CO3 | K2 | |
| | b. | What is parallel processing? Explain any parallel processing mechanism. | 7M | CO3 | K2 | |
| OR | | | | | | |
| 10 | a. | Explain the interconnection structure for multiprocessor systems | 7M | CO3 | K2 | |
| | b. | Explain the instruction pipeline processing in RISC architecture. | 7M | CO3 | K2 | |

| Course Code: B20CS1206 | | | | | |
|---|----|--|---------------|------|----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | R 20 | |
| I B. Tech II Semester Regular Examinations | | | | | |
| DATA STRUCTURES | | | | | |
| (For CSE) | | | | | |
| Time: 3 Hrs. | | | Max. Marks:70 | | |
| Answer any one Question from Each Unit | | | | | |
| All questions carry equal Marks | | | | | |
| | | | M | CO | KL |
| UNIT-I | | | | | |
| 1 | a. | Explain representation of array as an ADT along with their advantages and disadvantages. | 7M | CO1 | K3 |
| | b. | Arrange the following list of elements in ascending order using Merge Sort A, L, G, O, R, I, T, H, M, S Clearly show the sorting process at each step. | 7M | CO1 | K2 |
| OR | | | | | |
| 2 | a. | Write ADT operations for array implementation of polynomial addition. | 7M | CO1 | K2 |
| | b. | Sort the elements using Quick Sort: 52, 38, 81, 22, 48, 13, 69, 93, 14, 45, 58, 79, 72. | 7M | CO1 | K3 |
| UNIT-II | | | | | |
| 3 | a. | Define stack ADT. Explain basic operations of a stack ADT. | 7M | CO2 | K3 |
| | b. | Convert the given infix Expression $((A+B)*C-(D-E)^{(F+G)})$ into its Equivalent Prefix and Postfix Notations. | 7M | CO2 | K3 |
| OR | | | | | |
| 4 | a. | Explain the procedure to evaluate postfix expression $6\ 2\ 3\ +\ -\ 3\ 8\ 2\ /\ +\ * \ 2\ 4\ 3\ +.$ | 7M | CO2 | K3 |
| | b. | Discuss about implementation of queues using linked list | 7M | CO2 | K3 |
| UNIT-III | | | | | |
| 5 | a. | Compare singly and circular linked list while performing insertion and deletion operations | 7M | CO3 | K4 |
| | b. | Explain polynomial multiplication using linked list with an example. | 7M | CO3 | K3 |
| OR | | | | | |
| 6 | a. | List various operations of linked list and explain how to insert a node anywhere in the list. | 7M | CO3 | K2 |
| | b. | Explain various operations performed on doubly Linked Lists | 7M | CO3 | K3 |
| UNIT-IV | | | | | |
| 7 | a. | Sketch the binary search tree resulting after inserting the following integer keys 49, 27, 12, 11, 33, 77, 26, 56, 23, 6. i) Check whether the tree is almost complete or not? ii) Determine the height of the tree iii) Write post order and preorder traversals | 7M | CO4 | K3 |
| | b. | Create max heap for the following elements 33, 14, 65, 02, 76, 69, 59, 85, 47, 99, 98. | 7M | CO4 | K3 |

| OR | | | | | |
|---------------|----|---|----|-----|----|
| 8 | a. | A binary tree has seven nodes. The Preorder and Postorder traversal of the tree are given below. Can you draw the tree? Justify. Preorder : GFDABEC Postorder : ABDCEFG | 7M | CO4 | K3 |
| | b. | Write in-order, pre-order and post-order traversal of a binary tree. | 7M | CO4 | K2 |
| UNIT-V | | | | | |
| 9 | a. | What is minimum cost spanning tree? Discuss with an example. | 7M | CO5 | K2 |
| | b. | Explain Dijkstras Algorithm with an example | 7M | CO5 | K3 |
| OR | | | | | |
| 10 | a. | Discuss Kruskal's algorithm advantages and disadvantages. | 7M | CO5 | K3 |
| | b. | Discuss the Representation of Graphs. | 7M | CO5 | K2 |
