

[B19 HS 1101]
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE(A)
I B. Tech I Semester (R19) Regular Examinations
ENGLISH
(Common to CE,CSE,EEE,IT & MECH)
MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

| | | | CO | KL | M |
|-----------|------------|---|----|----|----------|
| | | UNIT-I | | | |
| 1. | a). | Write an essay on “A Drawer full of happiness”. | 2 | K2 | 8 |
| | b). | Develop the following hints into meaningful paragraphs (200 words) and provide a suitable title. Life- full of challenges - man accept realities - he to know - weaknesses and strongholds - ignorance of one's weaknesses take him nowhere - knowing and acknowledging this before making use of strongholds or virtues he must get rid of weaknesses - otherwise his voyage be stumbled - he plug the holes lest he be drowned. | 4 | K3 | 7 |
| | | OR | | | |
| 2. | a). | Write an essay on any ONE of the following. i) Pros and cons of Social Networking Sites ii) The essence of education | 4 | K4 | 8 |
| | b). | 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. | 5 | K1 | 7 |
| | | UNIT-II | | | |
| 3. | a). | Write an essay on the relevance of Nehru’s letter to Indira to the present context. | 2 | K2 | 8 |
| | b). | Fill in the blanks with appropriate articles/ prepositions. i) Role-play is a good way _____ creating real life situations. ii) He is popular _____ his contemporaries. iii) I hope it is _____ holiday resort. iv) As _____ matter of fact, I have _____ interview tomorrow. v) Finally, a word _____ what our countrymen can do to the nation. vi) A nation is a complex society _____ corresponding variations in culture. | 5 | K1 | 7 |
| | | OR | | | |

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| 4. | a). | Write 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. | 4 | K6 | 8 |
| | b). | Write antonyms and sentences for any SEVEN of the following words. i) procreate ii) hectic iii) reckon iv) beguile v) opulent vi) suffuse vii) astute viii) mandatory | 5 | K2 | 7 |
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| | | UNIT-III | | | |
| 5. | a). | Write an essay on "Stephen Hawking – Positivity 'Benchmark'". | 2 | K2 | 8 |
| | b). | Write a letter to the educational consultancy asking about the information regarding the post-graduation and research programmes in foreign universities. | 4 | K3 | 7 |
| | | OR | | | |
| 6. | a). | Write a resume and the covering letter for the post of a software engineer. | 4 | K3 | 8 |
| | b). | Write an E-mail to the manufacturer complaining about the computer that you bought recently. | 4 | K3 | 7 |
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| | | UNIT-IV | | | |
| 7. | a). | What does the author speak about "Liking a Tree, Unbowed"? | 2 | K2 | 8 |
| | b). | Give the meaning and write sentences of any SEVEN of the following foreign phrases. i) ab initio ii) a la mode iii) sieta iv) amour proper v) ad hoc vi) Alma Mater vii) alter ego viii) bonafide | 5 | K2 | 7 |
| | | OR | | | |
| 8. | a). | 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 | 2 | K2 | 8 |

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| | | <p>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.</p> <p>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 neighboring molecules.</p> <p>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.</p> | | | |
| | b). | Write a pamphlet on book exhibition. | 4 | K6 | 7 |
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| | | UNIT-V | | | |
| 9. | a). | What message does the author communicate to the readers through the lesson "Stay Hungry-Stay Foolish". | 2 | K2 | 8 |
| | b). | <p>Correct and Re-write any SEVEN of the following Sentences.</p> <p>i) One must use his best efforts if he wishes to succeed. ii) Since he came, we are happy. iii) I could hardly believe in my eyes. iv) Suppose, if you arrive late, you will miss the show. v) Neither Jack is intelligent nor hardworking. vi) Hardly the sun had risen when we set out. vii) It is high time she improves her behavior. viii) She gave me many informations.</p> | 5 | K2 | 7 |
| | | OR | | | |
| 10. | a). | Write a report to the editor about the problem of brain drain in India | 4 | K3 | 8 |
| | b). | <p>Fill in the blanks with the appropriate choices.</p> <p>i) The film Titanic was promoted with all the usual _____ a) hyperbole b) dialect c) taboo d) aesthetic ii) The schedule of a few planes was _____ due to heavy smog. a) prohibited b) abated c) impeded d) bolstered iii) Einstein had never bothered by the flood of _____ from his fellow critics. a) recantation b) castigation c) vituperation d) skepticism iv) The field had been _____ by heavy downpour last night. a) tirade b) fluctuated c) mixed d) saturated v) Modi is good at giving _____ speeches.</p> | 5 | K4 | 7 |

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| | | a) extempore b) prepared c) epilogue d) long vi) The manuscript was reproduced in _____. a) facsimile b) archives c) cache d) vacillation vii) Examine the report carefully before you _____ it publicly in front of the press and media. a) rescind b) repudiate c) revere d) redress | | | |
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[B19 BS 1101]
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)
I B. Tech I Semester (R19) Regular Examinations
MATHEMATICS – I
(Common to All Branches)
MODEL QUESTION PAPER

TIME: 3 Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT**

All questions carry equal marks

| | UNIT-I | CO | KL | M |
|---------|---|-----------|-----------|----------|
| 1.a) | Solve the system of equations $20x + y - 2z = 17$, $3x + 20y - z = -18$, $2x - 3y + 20z = 25$ by Gauss –Siedel method. | CO1 | K2 | 8 |
| b) | Investigate the values of λ and μ so that the equations $2x + 3y + 5z = 9$; $7x + 3y - 2z = 8$; $2x + 3y + \lambda z = \mu$; has (i)no solution (ii) unique solution (iii) infinite number of solutions | CO1 | K3 | 7 |
| (OR) | | | | |
| 2. a) | Solve the system of equations $10x + y+z =12$, $2x+10y+z =13$, $2x+2y+10z =14$ by Gauss- elimination method. | CO1 | K2 | 8 |
| b) | Define rank and find the rank of the matrix A by reducing it in to its normal form where $A \text{ is: } A = \begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}.$ | CO1 | K1 | 7 |
| UNIT-II | | | | |
| 3.a) | Verify Cayley-Hamilton theorem and find the inverse of the matrix $A = \begin{bmatrix} 1 & 0 & 3 \\ 2 & 1 & -1 \\ 1 & -1 & 1 \end{bmatrix}.$ | CO2 | K3 | 8 |
| b) | Reduce the quadratic form $2x^2 + 2y^2 + 2z^2 - 2xy - 2yz - 2zx$ to canonical form by orthogonal transformation | CO2 | K3 | 7 |
| (OR) | | | | |
| 4. a) | Find the eigenvalues and the corresponding eigen vectors of the matrix $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}.$ | CO2 | K3 | 8 |
| b) | If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$, use Cayley-Hamilton theorem to find the value of $2A^5 - 3A^4 + A^2 - 4I$. Also find the inverse of A. | CO2 | K3 | 7 |

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| | UNIT-III | | | |
| 5.a) | Solve $\frac{dy}{dx} + (\tan x)y = (\sec x)y^3$. | CO3 | K2 | 8 |
| b) | Find the orthogonal trajectories of the family of parabolas $ay^2 = x^3$. | CO3 | K3 | 7 |
| | (OR) | | | |
| 6. a) | Solve $(y^4 + 2y)dx + (xy^3 + 2y^4 - 4x)dy = 0$. | CO4 | K2 | 8 |
| b) | A body originally at 80°C cools down to 60°C in 20 minutes, the temperature of air being 40°C . What will be the temperature of the body after 40 minutes from the original? | CO4 | K3 | 7 |
| | UNIT-IV | | | |
| 7.a) | Solve $(D^3 - D)y = 2x + 1 + 4\cos x$. | CO5 | K2 | 8 |
| b) | Solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = e^x \log x$ by the method of variation of parameters. | CO5 | K2 | 7 |
| | (OR) | | | |
| 8. a) | Solve $(D^2 + 3D + 2)y = e^{e^x}$. | CO5 | K2 | 8 |
| b) | Solve the differential equation $x^2 \frac{d^2y}{dx^2} - x \frac{dy}{dx} + y = \log x$ | CO5 | K2 | 7 |
| | UNIT-V | | | |
| 9.a) | Find $L\{t \cos at\}$ and $L\left\{\int_0^t e^{-t} \cos t \, dt\right\}$. | CO6 | K2 | 8 |
| b) | Using convolution theorem evaluate $L^{-1}\left\{\frac{1}{(s+a)(s+b)}\right\}$. | CO6 | K3 | 7 |
| | (OR) | | | |
| 10.a) | Find $L^{-1}\left\{\frac{5s+3}{(s-1)(s^2+2s+5)}\right\}$. | CO6 | K2 | 8 |
| b) | Solve $\frac{d^2y}{dt^2} + 4\frac{dy}{dt} + 3y = e^{-t}$, $y(0) = y'(0) = 1$ by using Laplace transforms | CO6 | K3 | 7 |

[B19 BS 1103]
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)
I B. Tech I Semester (R19) Regular Examinations
ENGINEERING PHYSICS
(Common to CE & ME)
MODEL QUESTION PAPER

TIME: 3 Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT**

All questions carry equal marks

| | | | CO | KL | M |
|----|-----|--|----|----|----|
| | | UNIT - I | | | |
| 1. | a). | What is a Bravais Lattice and explain the Bravais lattice in different Crystal systems. | 1 | 2 | 9 |
| | b). | Deduce the Bragg's Law. | 1 | 3 | 6 |
| | | OR | | | |
| 2. | a). | How the nano materials can be produced by sol – gel method. | 1 | 2 | 7 |
| | b). | Write about Carbon Nanotubes | 1 | 2 | 4 |
| | C). | Discuss some important applications of nanomaterials. | 1 | 1 | 4 |
| | | UNIT - II | | | |
| 3. | a). | Define Reverberation and obtain the Sabine's formula. | 4 | 3 | 9 |
| | b). | Explain the requirements of an acoustics calling good hall | 4 | 2 | 6 |
| | | OR | | | |
| 4. | a). | Explaining Magnetostriction effect, describe how the ultrasonics can be produced. | 6 | 3 | 9 |
| | b). | Mention the application of ultrasonics. | 6 | 1 | 6 |
| | | UNIT - III | | | |
| 5. | a). | Distinguish between elastict and plasticts | 3 | 1 | 4 |
| | b). | State and explain the Hooke's law | 3 | 2 | 5 |
| | C). | Discuss the bending moment of a beans | 3 | 2 | 6 |
| | | OR | | | |
| 6. | a). | Explain the stress – strain curve of an isotropic material | 3 | 2 | 7 |
| | b). | What are the different types of moduli of solids and obtain their relations | 3 | 2 | 8 |
| | | UNIT - IV | | | |
| 7. | a). | Define polarization and explain the different types of polarization possible in a dielectric | 5 | 2 | 7 |
| | b). | Deduce the Claussius Mosotti & equation and its significance in dielectrics. | 5 | 3 | 8 |
| | | OR | | | |
| 8. | a). | Define Magnetic susceptibility and give a classification of magnetic materials. | 5 | 1 | 5 |
| | b). | Describe the Hysteresis exhibited by Ferromagnetic materials and explain its using a Suitable theory | 5 | 3 | 10 |
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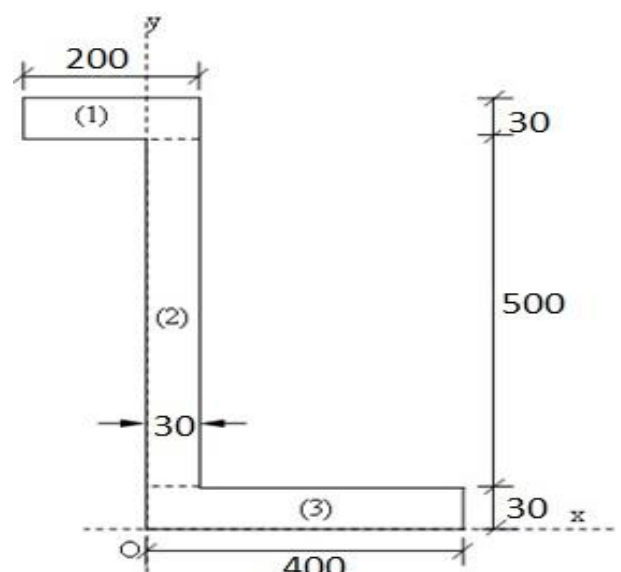
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| | | UNIT - V | | | |
| 9. | a). | Give the selection procedure of the active medium of laser device. | 6 | 2 | 7 |
| | b). | With suitable diagrams, discuss the working principle, design and working of He – Ne laser system | 6 | 2 | 8 |
| | | OR | | | |
| 10. | a). | What is the significance of Numerical Aperture of an optical fiber and obtain an expression for it. | 6 | 2 | 8 |
| | b). | Discuss the sensor applications of optical fiber. | 6 | 2 | 7 |

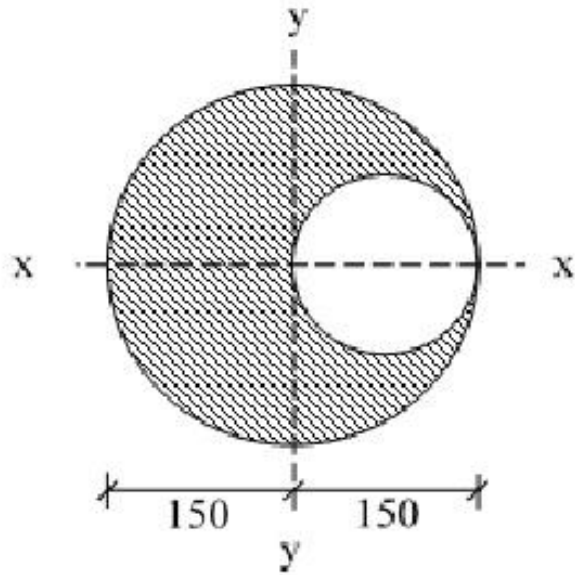
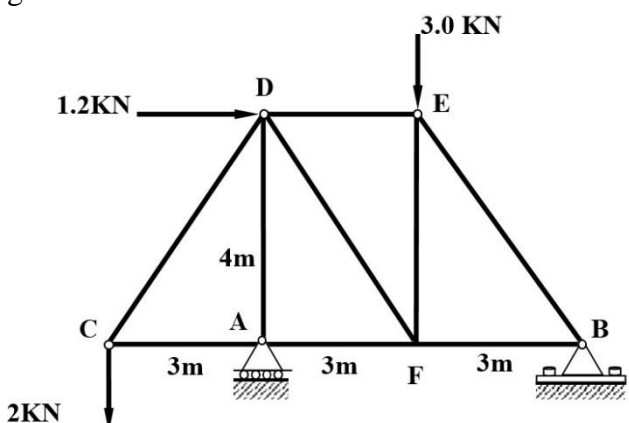
[B19CE1101]
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)
I B. Tech I Semester (R19) Regular Examinations
ENGINEERING MECHANICS
Civil Engineering
MODEL QUESTION PAPER

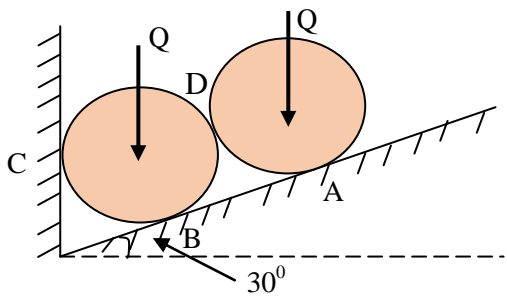
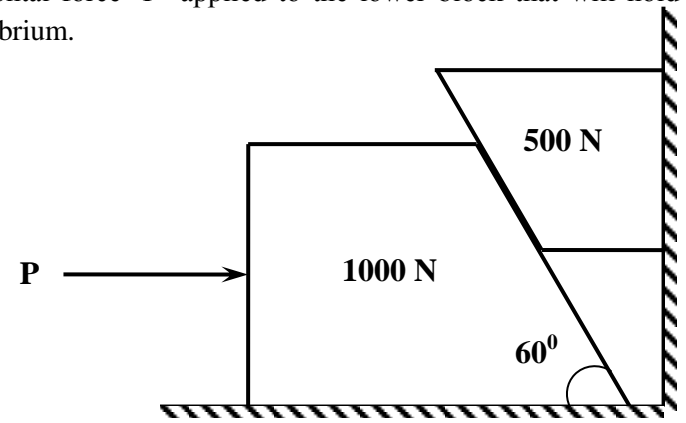
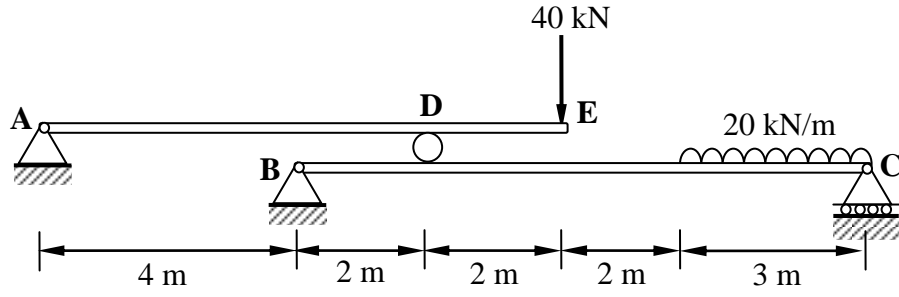
TIME: 3Hrs.

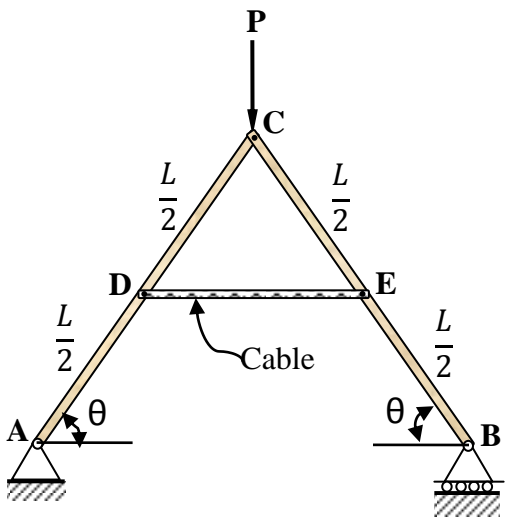
Max. Marks: 75 M

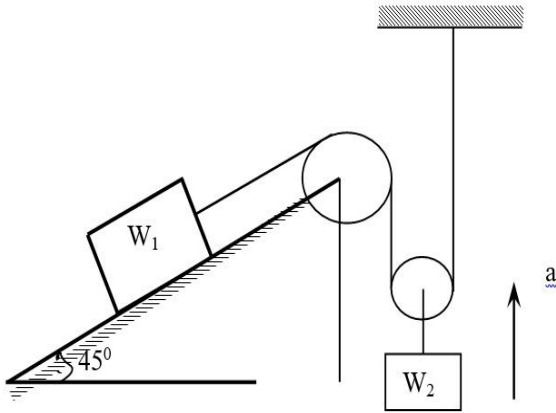
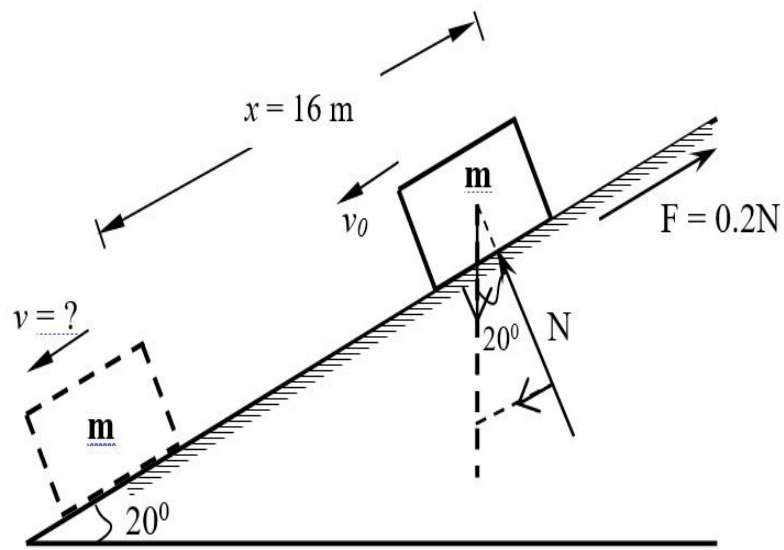
Answer **ONE Question** from **EACH UNIT**.
 All questions carry equal marks.

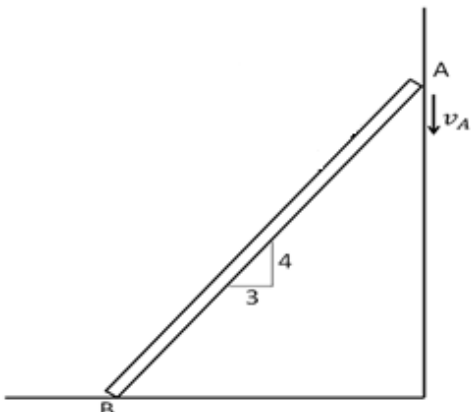
| | | | CO | KL | M |
|----|-----|---|----|----|---|
| | | UNIT-I | | | |
| 1. | a). | The following are the four forces acting at a point on a body. Find the resultant and its position. i. 500N at N 45° E ii. 100N at N 80° E iii. 300N at S 30° E iv. 600N at N 20° W | 1 | K2 | 8 |
| | b). | Find the centroid of Z – section shown in fig. (All units are in mm)  | 1 | K3 | 7 |
| | | OR | | | |
| 2. | a). | State and prove Parallel axis theorem. | 1 | K2 | 8 |
| | b). | Determine moment of inertia for shaded region shown in fig.(All units are in mm) | 1 | K3 | 7 |

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| | | UNIT-II | | | |
| 3. | | <p>Solve for the Forces in all the members of the truss supported on roller at A and hinge at B.</p>  | 2 | K3 | 15 |
| | | OR | | | |
| 4. | a). | <p>Two identical rollers, each of weight $Q = 100 \text{ kg}$ are supported by an inclined plane and a vertical wall as shown in Fig. Applying conditions of equilibrium, determine the reactions at points of support A, B and C. assume the surfaces are smooth.</p> | 2 | K3 | 8 |

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| | b). | <p>Referring to the figure, the coefficients of friction are as follows: 0.25 at floor, 0.3 at the wall and 0.2 between the blocks. Determine the minimum value of a horizontal force 'P' applied to the lower block that will hold the system in equilibrium.</p>  | 2 | K3 | 7 |
| | | UNIT-III | | | |
| 5. | | <p>Determine the reactions at supports A, B and C for the loaded beam shown in Figure below. Use virtual work method only.</p>  | 3 | K3 | 15 |
| | | OR | | | |
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| 6. | | Use virtual work method to determine the tension in the cable in terms of θ for the arrangement shown below. | 3 | K3 | 15 |
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| UNIT-IV | | | | | |
| 7. | a). | A particle moves along a straight line. Its motion is represented by the equation $S = 16t + 4t^2 - 3t^3$ where, S is in meters and t is in Seconds, Determine a. Displacement, velocity and acceleration 2 seconds after start: b. Displacement and acceleration when velocity is zero and c. Displacement and velocity when acceleration is zero | 4 | K3 | 8 |
| | b). | A stone dropped into a well is heard to strike the water after 4 seconds. Find the depth of the well, if the velocity of sound is 350 m/sec. | 4 | K3 | 7 |
| OR | | | | | |
| 8. | a). | Find the height of the tower from top of which an object falls freely and during the last second of its motion, the object travels a distance is equal to $\frac{2}{3}$ of height of the tower. $g = 9.81 \text{ m/sec}^2$ | 4 | K3 | 8 |
| | b). | A gun is fired from the top of a hill 100m above the sea level. Ten seconds later the bullet is found to hit the warship 1000m away from the position of the gun. Determine the velocity and angle of projection of the bullet. With what velocity bullet strikes the ship? | 4 | K3 | 7 |
| UNIT-V | | | | | |
| 9. | a). | Find the tension S in the string during the motion of the system shown in fig. If $W_1 = 200 \text{ N}$ and $W_2 = 100 \text{ N}$, the system is in the vertical plane and coefficient of friction between the inclined plane and block W_1 is $\mu = 0.2$. Assume the pulley is without weight and friction. | 5 | K3 | 8 |

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| | b). | Two bodies, one of which is 400 N with a velocity of 8 m/sec and the other of 250 N with a velocity of 12 m/sec, move towards each other along a straight line and collide centrally. Find the velocity of each body after impact if the coefficient of restitution is 0.8. Also find the loss in Kinetic Energy? | 5 | K3 | 7 |
| | | OR | | | |
| 10. | a). | <p>Calculate the velocity 'v' of a block weighing 40 N, when it travels down the 20° incline for 16 m at B (Fig 4); if it is given an initial velocity of 3 m/sec at A. The coefficient of friction between the block and the inclined plane is 0.2.</p>  | 5 | K3 | 8 |

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| | <p>b). A 5 m long ladder shown in Fig. begins to slip down the wall at A at a rate of 1 m/sec. Find the location of the instantaneous centre of rotation of the ladder. Also, find the velocity of point B at the base of the ladder using instantaneous centre method.</p>  | 5 | K3 | 7 |
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[B19ME1101]
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)
I B. Tech I Semester (R19) Regular Examinations
ENGINEERING DRAWING
(Common to CE,EEE & ME)
Department of Mechanical Engineering
MODEL QUESTION PAPER

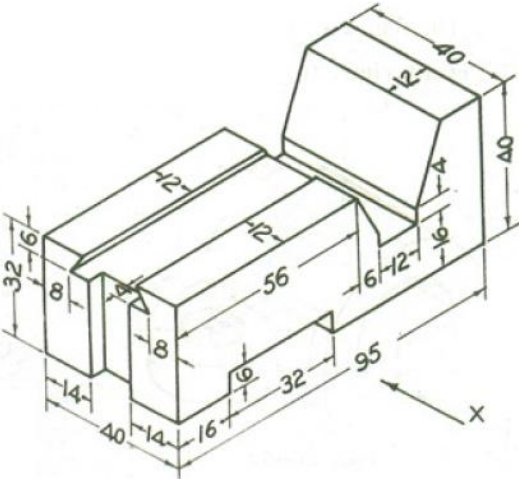
TIME: 3Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

| | | | CO | KL | M |
|----|-----|--|----|----|----|
| | | UNIT-I | | | |
| 1. | | An inelastic string 145 mm long has its one end attached to the circumference of a circular disc of 40 mm diameter. Draw the curve traced out by the other end of the string, when it is completely wound around the disc, keeping the string always tight. | 1 | K3 | 15 |
| | | OR | | | |
| 2. | | Two fixed points A and B are 100mm apart, Trace the complete path of a point P moving (in the same plane as that of A and B) in such a way that the sum of its distance from A and B is always the same and equal to 125mm. Name the curve and draw another curve parallel to and 25mm away from this curve. | 1 | K3 | 15 |
| | | | | | |
| | | UNIT-II | | | |
| 3. | a). | Draw the projections of the following points on the same ground line, keeping the projectors 25mm apart. (i) Point A in the HP and lying 20mm behind the VP; (ii) Point B is 40mm above the HP and 25mm in front of the VP; (iii) Point C is 25mm below the HP and 25mm behind the VP; (iv) Point D is 15mm above the HP and 50mm behind the VP. | 2 | K3 | 8 |
| | b). | Draw the projections of a 75mm long straight line in the following positions: (i) parallel to and 30mm above the HP and in the VP; (ii) perpendicular to the VP, 25mm above the HP and its one end in the VP; (iii) Inclined at 30^0 to the HP and its one end 20mm above it, parallel to and 30mm in front of the VP. | 2 | K3 | 7 |
| | | OR | | | |
| 4. | | A line AB, of 80 mm long has its end A, 15 mm in front of VP and 20 mm above HP. The other end B is 40 mm above HP and 50 mm in front of VP. Draw the projections of the line and determine the inclinations of the line with HP and VP. | 2 | K3 | 15 |
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| | | UNIT-III | | | |
| 5. | | Draw a rhombus of diagonals 100 mm and 60 mm long, with the longer diagonal horizontal. The figure is the top view of a square of 100mm long diagonals, with a corner on the ground. Draw its front view and determine the angle which its surface makes with the ground. | 3 | K3 | 15 |

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| | | OR | | | |
| 6. | | A semicircular plate of 40mm diameter has its straight edge in the VP and inclined at 45° to the HP, the surface of the plate makes an angle of 30° with the VP. Draw its projections. | 3 | K3 | 15 |
| | | | | | |
| | | UNIT-IV | | | |
| 7. | | A hexagonal pyramid, base 25mm side and axis 50mm long, has an edge of its base on the ground. Its axis is inclined at 30° to the ground and parallel to the VP. Draw its projections. | 4 | K3 | 15 |
| | | OR | | | |
| 8. | | Draw the projections of a cylinder 75mm diameter and 100mm long, lying on the ground with its axis inclined at 30° to the VP and parallel to the ground. | 4 | K3 | 15 |
| | | | | | |
| | | UNIT-V | | | |
| 9. | | A square pyramid with base side 40mm and height 60mm is resting on a cube of sides 50mm, the axes of the cube and the pyramid being in the same line. Two sides of the base of the pyramid are parallel to the edges of the cube. Draw the isometric view. | 5 | K3 | 15 |
| | | OR | | | |
| 10. | | <p>Draw (i) Front View (ii) Top View (iii) Side View of the object shown below:</p>  <p>All the dimensions are in mm</p> | 6 | K3 | 15 |

[B19 BS 1201]
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)
I B. Tech II Semester (R19) Regular Examinations
MATHEMATICS – II
(Common to CE, EEE & ME)
MODEL QUESTION PAPER

TIME : 3 Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT**
 All questions carry equal marks

| UNIT-I | | | | | | | | CO | KL | M |
|----------|--|-----|-----|-----|-----|-----|----|-----|----|---|
| 1.a) | Using Newton's forward difference interpolation formula find Y (3), from the following table | | | | | | | CO3 | K2 | 8 |
| | | | | | | | | | | |
| | X | 0 | 5 | 10 | 15 | 20 | 25 | | | |
| Y | 7 | 11 | 14 | 18 | 24 | 32 | | | | |
| b) | Find the interpolating polynomial f(x) for the data of the following table | | | | | | | CO3 | K1 | 7 |
| | x | 0 | 1 | 4 | 5 | | | | | |
| | f(x) | 4 | 3 | 24 | 39 | | | | | |
| (OR) | | | | | | | | | | |
| 2. a) | Using Gauss backward formula, find f(42), from the following table | | | | | | | CO4 | K2 | 8 |
| | | | | | | | | | | |
| | X | 20 | 25 | 30 | 35 | 40 | 45 | | | |
| f(x) | 354 | 332 | 291 | 260 | 231 | 204 | | | | |
| b) | Using Lagrange's interpolation formula find Y (10) from the following table | | | | | | | CO4 | K3 | 7 |
| | | | | | | | | | | |
| | x | 5 | 6 | 9 | 11 | | | | | |
| Y | 12 | 13 | 14 | 16 | | | | | | |
| UNIT-II | | | | | | | | | | |
| 3.a) | Find the cube root of 41 using Newton-Raphson method. | | | | | | | CO5 | K2 | 8 |
| b) | Evaluate $\int_0^2 \frac{dx}{x^3+x+1}$ by using Simpsons 1/3 rd rule with $h = 0.25$ | | | | | | | CO5 | K2 | 7 |
| (OR) | | | | | | | | | | |
| 4. a) | Find a real root of the equation $x \log_{10} x=1.2$ by Regula-false method correct tothree decimal places | | | | | | | CO5 | K2 | 8 |
| b) | Evaluate y(0.8) using Runge Kutta method given $y' = (x + y)^{\frac{1}{2}}, y(0.4) = 0.41$ | | | | | | | CO5 | K3 | 7 |
| UNIT-III | | | | | | | | | | |
| 5.a) | If $U = \tan^{-1} \frac{x^3+y^3}{x-y}$ and $x U_x + y U_y = \sin 2U$, prove that $x^2U_{xx}+ 2xy U_{xy} + y^2U_{yy} = 2\cos 3U \sin U$. | | | | | | | CO1 | K2 | 8 |

| | | | | |
|----------------|---|-----|----|---|
| b) | If $u = x^2 - 2y^2$, $v = 2x^2 - y^2$ where $x = r \cos \theta$, $y = r \sin \theta$ then show that $\frac{\partial(u,v)}{\partial(r,\theta)} = 6r^3 \sin 2\theta$. | CO1 | K2 | 7 |
| (OR) | | | | |
| 6. a) | Expand $x^2y + 3y - 2$ in powers of $(x - 1)$ and $(y + 2)$ using Taylor's theorem. | CO1 | K2 | 8 |
| b) | By using the method of differentiation under the integral sign prove that $\int_0^\infty \frac{\tan^{-1}(ax)}{x(1+x^2)} dx = \frac{\pi}{2} \log(1+a)$, $a \geq 0$. | CO1 | K3 | 7 |
| UNIT-IV | | | | |
| 7. a) | Solve $x^2(y - z)p + y^2(z - x)q = z^2(x - y)$. | CO2 | K2 | 8 |
| b) | solve $(D^2 - DD' - 2D'^2)z = (y - 1)e^x$. | CO2 | K2 | 7 |
| (OR) | | | | |
| 8. a) | Solve $x(y - z)p + y(z - x)q = z(x - y)$. | CO2 | K2 | 8 |
| b) | solve $(D + D' - 1)(D + 2D' - 3)z = 3x + 6y + 4$. | CO2 | K2 | 7 |
| UNIT-V | | | | |
| 9.a) | Obtain the solution of $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} = 0$ by the method of separation of variables. | CO6 | K2 | 8 |
| 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, find the displacement at any subsequent time. | CO6 | K3 | 7 |
| (OR) | | | | |
| 10.a) | Obtain the solution of $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = 0$ by the method of separation of variables. | CO6 | K2 | 8 |
| b) | A bar of conducting material of length π units is initially kept at a temperature $\sin x$. Find the temperature at any subsequent time if the ends of the bar are held at zero temperature. | CO6 | K3 | 7 |

[B19 BS 1202]
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE(A)
I B. Tech II Semester (R19) Regular Examinations
MATHEMATICS – III
(Common to CE,CSE,ECE,EEE & IT)
MODEL QUESTION PAPER

TIME : 3 Hrs.

Max. Marks : 75 M

Answer **ONE Question** from **EACH UNIT**

All questions carry equal marks

| | UNIT-I | CO | KL | Marks |
|----------|---|-----|----|-------|
| 1.a) | Find the Fourier series for the function $f(t) = \begin{cases} -1, & -\pi < t < -\pi/2 \\ 0, & -\pi/2 < t < \pi/2 \\ 1, & \pi/2 < t < \pi \end{cases}$ | CO1 | K2 | 7 |
| b) | Obtain Fourier series of the function $f(x) = 2x - x^2$ in $(0, 3)$ and hence deduce that $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots = \frac{\pi}{12}$ | CO1 | K2 | 8 |
| (OR) | | | | |
| 2. a) | Obtain a 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 $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \dots = \frac{\pi^2}{8}$ | CO1 | K2 | 8 |
| b) | Find the Half – Range cosine series for the function $f(x) = x^2$ in the range $0 \leq x \leq \pi$ | CO1 | K3 | 7 |
| UNIT-II | | | | |
| 3.a) | Using the Fourier Sine Transform of e^{-ax} ($a > 0$), evaluate $\int_0^{\infty} \frac{x \sin kx}{a^2 + x^2} dx$ | CO2 | K3 | 7 |
| b) | Using Fourier integral representation, show that $\int_0^{\infty} \frac{\omega \sin \omega x}{1 + \omega^2} d\omega = \frac{\pi}{2} e^{-x}, x > 0$ | CO2 | K3 | 8 |
| (OR) | | | | |
| 4. a) | Find the inverse Fourier sine transform $f(x)$ of $F_s(p) = \frac{p}{1+p^2}$ | CO2 | K2 | 8 |
| b) | Using Parseval's Identity, prove that $\int_0^{\infty} \frac{x^2}{(1+x^2)^2} dx = \frac{\pi}{4}$ | CO2 | K3 | 7 |
| UNIT-III | | | | |
| 5.a) | Express $\int_0^{\infty} \sqrt{x} e^{-x^3} dx$ in terms of gamma function. | CO3 | K2 | 7 |
| b) | Express $\int_0^1 x^m (1-x^n)^p dx$ in terms of Gamma functions and hence evaluate $\int_0^1 x^7 (1-x^5)^8 dx$ | CO3 | K2 | 8 |

| | | | | |
|----------------|--|-----|----|----|
| (OR) | | | | |
| 6. a) | Apply change the order of integration and evaluate $\int_0^{\infty} \int_x^{\infty} \frac{e^{-y}}{y} dy dx$. | CO3 | K3 | 8 |
| b) | Obtain the volume of the tetrahedron bounded by $x = 0, y = 0, z = 0, x+y+z = 1$. | CO3 | K3 | 7 |
| UNIT-IV | | | | |
| 7.a) | Obtain the directional derivative of $\phi = xy + yz + zx$ at A in the direction of AB where $A = (1, 2, -1), B = (5, 6, 8)$. | CO4 | K2 | 8 |
| b) | Determine curl (curl F) where $\vec{F} = x^2y \vec{i} - 2xz \vec{j} + 2yz \vec{k}$ | CO4 | K2 | 7 |
| (OR) | | | | |
| 8. a) | Show that the vector $(x^2 - yz)\vec{i} + (y^2 - zx)\vec{j} + (z^2 - xy)\vec{k}$ Is irrotational and find its scalar potential. | CO4 | K2 | 8 |
| b) | Determine the values of a and b such that the surface $ax^2 - byz = (a+2)x$ and $4x^2y + z^3 = 4$ cut orthogonally at $(1, -1, 2)$. | CO4 | K2 | 7 |
| UNIT-V | | | | |
| 9.a) | Determine the work done in moving a particle once round the circle $x^2 + y^2 = 9$ in the xy- plane by the force $\vec{F} = (2x - y - z)\vec{i} + (x + y - z^2)\vec{j} + (3x - 2y + 4z)\vec{k}$. | CO5 | K2 | 7 |
| b) | Evaluate the line integral by Stokes's theorem for the vector function $\vec{F} = y^2\vec{i} + x^2\vec{j} + (z + x)\vec{k}$ and C is the triangle with vertices $(0, 0, 0), (1, 0, 0)$ and $(1, 1, 0)$. | CO6 | K3 | 8 |
| (OR) | | | | |
| 10 | Verify Green's theorem in the plane $\int_C [(3x^2 - 8y^2)dx + (4y - 6xy)dy]$, where C is boundary of the region defined by $y = \sqrt{x}, y = x^2$ | CO6 | K3 | 15 |

[Code : B19BS1204]
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)
I B.Tech II Semester (R19) Regular Examinations.
ENGINEERING CHEMISTRY
(Common to CE & ME)
MODEL QUESTION PAPER

Time : 3Hrs.

Max. Marks :75M

Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

| | | | CO | KL | M |
|-----|-----|--|----|----|---|
| | | UNIT - I | | | |
| 1. | a). | What is hardness? How it is determined by EDTA method? Explain. | 1 | 1 | 8 |
| | b). | Describe with equations how water can be softened using Lime & Soda Process | 1 | 2 | 7 |
| | | OR | | | |
| 2. | a). | Discuss various sterilizing methods used in municipal water treatment. | 1 | 2 | 8 |
| | b). | Illustrate the reverse osmosis Process with a neat diagram. | 1 | 2 | 7 |
| | | UNIT - II | | | |
| 3. | a). | Explain the Proximate analysis of coal and give its significance. | 2 | 2 | 8 |
| | b). | Explain the fractional distillation of crude oil. | 2 | 2 | 7 |
| | | OR | | | |
| 4. | a). | Write notes on (i)Knocking (ii)CNG | 2 | 1 | 8 |
| | b). | How Synthetic Petrol can be prepared by Bergius Process. | 2 | 1 | 7 |
| | | UNIT - III | | | |
| 5. | a). | Explain the mechanism of electrochemical theory of corrosion with neat diagram. | 3 | 2 | 8 |
| | b). | Describe briefly about cathodic Protection. | 3 | 2 | 7 |
| | | OR | | | |
| 6. | a). | Explain Hydrogen – Oxygen fuel cell with neat cell diagram | 3 | 2 | 8 |
| | b). | Discuss on various constituents of Paint. | 3 | 6 | 7 |
| | | UNIT - IV | | | |
| 7. | a). | Explain the mechanism of free radical Polymerization reaction with a suitable example. | 4 | 2 | 8 |
| | b). | Distinguish between thermoplastics and thermosetting resins. | 4 | 4 | 7 |
| | | OR | | | |
| 8. | a). | What are conducting Polymers? Discuss the applications of conducting Polymers. | 4 | 1 | 8 |
| | b). | Write notes on Bu Na – S and Bu Na – N. | 4 | 1 | 7 |
| | | UNIT - V | | | |
| 9. | a). | Discuss chemistry involved in setting and hardening of cement? | 5 | 6 | 8 |
| | b). | What are refractories? Discuss the classification of refractories. | 5 | 1 | 7 |
| | | OR | | | |
| 10. | a). | Write detailed account of various types of ceramics, their Properties and uses. | 5 | 1 | 8 |
| | b). | What are insulators? How are they are classified? Give examples. | 5 | 1 | 7 |

[B19CS1201]
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)
I B.Tech II Semester (R19) Regular Examinations.
PROGRAMMING FOR PROBLEM SOLVING USING C
(Common to CE,EEE & ME)
MODEL QUESTION PAPER

Time : 3Hrs

Max. Marks :75 M

Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

| | | | CO | KL | M |
|-----|-----|---|-----|----|----|
| | | UNIT - I | | | |
| 1. | a). | Describe various types of computer languages | CO1 | K2 | 8M |
| | b). | Explain various types of Number systems? | CO1 | K2 | 7M |
| | | OR | | | |
| 2. | a). | Explain various data types in C Language | CO1 | K2 | 8M |
| | b). | Define an operator? Describe Increment and decrement operator with an example | CO1 | K1 | 7M |
| | | UNIT - II | | | |
| 3. | a). | Explain various types of Bitwise Operators with examples | CO2 | K2 | 8M |
| | b). | Differentiate between if statement and if-else statement with suitable examples and proper syntax | CO2 | K2 | 7M |
| | | OR | | | |
| 4. | a). | Write a program whether given number is Armstrong number or not | CO2 | K3 | 8M |
| | b). | Differentiate break and continue statement with an example | CO2 | K2 | 7M |
| | | UNIT - III | | | |
| 5. | a). | How to declare, initialize and reading of one dimensional array with an example | CO3 | K1 | 8M |
| | b). | Explain various string manipulation functions | CO3 | K2 | 7M |
| | | OR | | | |
| 6. | a). | Write a C program for multiplication of two matrices | CO3 | K3 | 8M |
| | b). | Define a structure? How to declare ,initialize , accessing of structure elements with example | CO3 | K1 | 7M |
| | | UNIT - IV | | | |
| 7. | a). | Define a pointer? explain pointer arithmetic | CO4 | K2 | 8M |
| | b). | Explain Dynamic Memory Allocation | CO4 | K2 | 7M |
| | | OR | | | |
| 8. | a). | Explain array of pointers with an example | CO4 | K2 | 8M |
| | b). | Outline C Pre-processor and write various pre-processor commands | CO4 | K2 | 7M |
| | | UNIT - V | | | |
| 9. | a). | Define a function? Explain various categories of functions | CO5 | K2 | 8M |
| | b). | Explain with an example passing array as an argument to a function | CO5 | K2 | 7M |
| | | OR | | | |
| 10. | a). | Define a recursive function? Write a program for GCD of two numbers using recursion | CO5 | K3 | 8M |
| | b). | Explain various types of file functions? | CO5 | K2 | 7M |

[B19CE1201]
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)
I B. Tech II Semester (R19) Regular Examinations
COMPUTER AIDED ENGINEERING DRAWING
Civil Engineering
MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks: 45 M

Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

| | | PART-A | CO | KL | M |
|----|--|----------|----|----|----|
| | | UNIT-I | | | |
| 1. | Draw the projections of a cube of 25mm long edges resting on the HP on one of its corners with a solid diagonal perpendicular to VP. | | 1 | K3 | 15 |
| | | OR | | | |
| 2. | A pentagonal pyramid base 25mm side and axis 50mm long has one of its triangular faces in the VP and the edge of the base contained by that face makes an angle of 30 ⁰ with the HP. Draw its projections. | | 1 | K3 | 15 |
| | | UNIT-II | | | |
| 3. | A hexagonal pyramid, base 30 mm side and axis 75 mm long, resting on its base on HP with two of its edges parallel to VP is cut by two section planes both perpendicular VP. The horizontal section plane cuts the axis at a point 35 mm from the apex. The other plane which makes an angle of 45 ⁰ with the HP also intersects the axis at the same point. Draw the front view, sectional top view and true shape of section. | | 2 | K3 | 15 |
| | | OR | | | |
| 4. | A cone of base diameter 50 mm and axis 60 mm is resting on its base on the HP. Draw the development of its lateral surface when it is cut by an auxiliary inclined plane inclined at 60 ⁰ to the HP and bisection the axis. | | 3 | K3 | 15 |
| | | UNIT-III | | | |
| 5. | A cylinder of 75 mm diameter and 125 mm height stands on its base on the ground. It is penetrated centrally by a cylinder, 50 mm diameter and 125 mm long, whose axis parallel to VP and is, inclined at 30 ⁰ to the HP. Draw the projection showing curves of intersection. | | 4 | K3 | 15 |
| | | OR | | | |
| 6. | Draw the perspective projection of a rectangular block of 20 mm × 50 mm × 50 mm high when one of its vertical edges is touching the PP. The side containing that edge recedes 30 ⁰ to the right of PP. The observer is standing in front of the edge at a distance of 100 mm and height of observer is 90 mm | | 5 | K3 | 15 |