

Course Code: B23HS1101					
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					R23
I B.Tech. I Semester MODEL QUESTION PAPER					
COMMUNICATIVE ENGLISH					
Common to all Programmes of Engineering					
Time: 3 Hrs.			Max. Marks: 70 M		
Answer Question No.1 compulsorily					
Answer ONE Question from EACH UNIT					
Assume suitable data if necessary					
10 x 2 = 20 Marks					
			CO	KL	M
1.	a).	Construct any four expressions used for invitations.	1	3	2
	b).	Build a short conversation on "Importance of learning a foreign language".	1	3	2
	c).	Choose the suitable transition/discourse markers: i. I fired at the leopard; he shook my arm. a) as b) since c) because d) for ii. The flood victims are short of food. they urgently need medical supplies. a) Similarly b) In addition c) Any how d) For instance	2	3	2
	d).	Construct a sentence for each of the following words. i. Flutter ii. Obsolete	2	3	2
	e).	Choose the appropriate articles to fill-in the blanks: i. Srikanth is planning to go to United States of America. ii. John built yard for his cattle.	3	3	2
	f).	Construct the sentences with appropriate prepositions: i. Shivaji Maharaj fought every kind of aggression. ii. How did these things come	3	3	2
	g).	Construct the following chunks into meaningful sentences. i. The platform is on the train. ii. To college walk I every day.	4	3	2
	h).	Organize the given sentences into a meaningful paragraph: i. The foundation stone was laid in 1972. ii. As a result, the city suffered from horrendous traffic congestion. iii. It was going to be the first in South Asia. iv. They plied in the center of the road. v. To ease traffic in the city, it was decided that an underground railway line would be built. vi. Calcutta, unlike other cities, keeps its trams.	4	3	2

	i).	Construct a short note (50 words) on Scanning technique.	5	3	2
	j).	Develop four relevant sentences for the following pictorial representation. 	5	3	2

5 x 10 = 50 Marks

		UNIT-1	CO	KL	M
2.	a).	Identify the different ways in which O. Henry tells his readers about the financial situation of the couple “Mr Jim and Mrs Della”.	1	3	5
	b).	Develop a conversation for the following context. Sasi introduces her friend A K Narayana, who has been admitted to the first year B. Tech Class, to her English Professor Dr. Rajeev Prakasam.	1	3	5
		OR			
3.	a).	Develop the theme “Self-help is the best help” through a story of your own.	1	3	5
	b).	Make use of appropriate expressions to fill in the blanks. Teacher - Students. I hope everyone has completed the History homework I gave yesterday. Raj – Good Morning, Ma’am _____ Teacher – Raj, what happened? Why _____ completed your homework? Raj – _____ Ma’am; I had a severe headache yesterday. Teacher – Well, _____ for today. Try to take your friend’s help and complete it by the end of day, _____ by tomorrow morning. Raj – Okay Ma’am, _____ complete the homework by recess. Teacher – _____ repeat this, Raj. All these will count for your internal marks. And I _____ that you are a hard worker. Raj – _____, Ma’am. I _____. Thank you so much for understanding.	1	3	5

UNIT-2					
4.	a).	Construct an essay on the lines ‘ <i>For men may come and men may go, / But I go on forever</i> ’ in the poem ‘The Brook’.	2	3	5
	b).	Make a list of any five Cohesive Devices and use them in your own sentences.	2	3	5
OR					
5.	a).	Construct a Paragraph on any one of the following in 100 words. i. “Practice makes man perfect”. ii. NEP-2020	2	3	5
	b).	Distinguish the following pairs and use them in sentences. i. aisle/isle ii. Four/fore iii. paws/pause iv. Sell/cell v. reign/rain	2	3	5
UNIT-3					
6.	a).	Examine the life of Elon Musk to prove that he is a visionary leader of cutting-edge technology. Discuss with relevant examples.	3	4	5
	b).	Examine the errors and construct correct counterparts. i. Many peoples attended the funeral of the great man. ii. The shepherd took the cattles to the field. iii. Sita could not understands what the teacher was saying. iv. Do you know the importance for clean water? v. Laugh is the best medicines.	3	4	5
OR					
7.	a).	Assume appropriate verb forms to fill in the following blanks. i. Were you (pay) attention to what was being said? ii. Raman (live) in Chennai for 10 years. iii. Suraj (love) going to the parties with his friends. iv. Neither of my brothers (have) any children. v. Nobody (be) allowed to drive unless they are eighteen.	3	4	5
	b).	Examine the errors and construct correct counterparts. i. You can take Visakha Express to Mumbai. ii. There are a pair of trousers. iii. The committee has voted as per their choice. iv. The clothes were neatly hanged on the cloth line. v. The film show began when we arrived in the hall.	3	4	5
UNIT-4					
8.	a).	Infer the way by which the children found it exciting to play with their new non-violent toys.	4	4	5
	b).	Analyse your requirement of transfer certificate as undergraduate for applying for a postgraduate course in a letter to your Principal.	4	4	5
OR					

9.	a).	Assume relevant credentials and build a CV for the following position mentioned. You are a fresh graduate in Computer Science Engineering from the National Institute of Technology, Trichy. You found an advertisement in the Hindu that Infosys hires Web Developers.	4	4	5
	b).	As a recent buyer of the car, assume relevant information and draft an E-mail to the Manager of XYZ automotive company, Mr. Kishore, regarding the poor quality of service facility available in the city. Sign the E-mail as Anil.	4	4	5
		UNIT-5			
10.	a).	Analyze the ways in which you can incorporate intrapersonal communication in your own life.	5	4	5
	b).	Analyze the following passage carefully and write an answer to the questions given in the following. Caffeine, the stimulant in coffee, has been called “the most widely used psychoactive substance on Earth”. Synder, Daly and Bruns have recently proposed that caffeine affects behavior by countering the activity in the human brain of a naturally occurring chemical called adenosine. Adenosine normally depresses neuron firing in many areas of the brain. It apparently does this by inhibiting the release of neurotransmitters, chemicals that carry nerve impulses from one neuron to the next. Like many other agents that affect neuron firing, adenosine must first bind to specific receptors on neuronal membranes. There are at least two classes of these receptors, which have been designated A1 and A2. Snyder et al propose that caffeine, which is structurally similar to adenosine, is able to bind to both types of receptors, which prevents adenosine from attaching there and allows the neurons to fire more readily than they otherwise would. 1. What is known as the most widely used psychoactive substance on Earth? 2. How does caffeine affect one’s behaviour? 3. What are Neurotransmitters? 4. Write synonyms for stimulant. 5. Find a suitable word to replace the highlighted word – “Adenosine normally depresses neuron firing in many areas of the brain.	5	4	5
		OR			
11.	a).	Analyze and develop an essay on “Artificial Intelligence influence on Human thought”.	5	4	5
	b).	Simplify (Précis) the following paragraph. “Women entrepreneurs in the developing world often face challenges that limit their chances for success and growth. They often have less	5	4	5

	<p>access to education than men and have difficulty getting financing on their own. But with an understanding of the essential aspects of doing business – such as planning, financing, networking and marketing – they can overcome those obstacles. That's where the 10,000 Women Initiative comes in. As Faiza Elmasry tells us, it's an investment in education with dividends that benefit the businesswomen, their local communities, and their national economies.” (Goldman Sachs invests in Educating Women in Business, Voice of America, voanews.com)</p>			
	CO-COURSE OUTCOME	KL-KNOWLEDGE LEVEL	M-MARKS	

NOTE : Questions can be given as A,B splits or as a single Question for 10 marks



Course Code: B23BS1101					
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					R23
I B.Tech. I Semester MODEL QUESTION PAPER					
LINEAR ALGEBRA AND CALCULUS					
Common to all Programmes of Engineering					
Time: 3 Hrs.			Max. Marks: 70 M		
Answer Question No.1 compulsorily					
Answer ONE Question from EACH UNIT					
Assume suitable data if necessary					
10 x 2 = 20Marks					
			CO	KL	M
1.	(a)	State Cauchy-Binet formula.	1	1	2
	(b)	Discuss the conditions for testing the consistency of a system of non-homogeneous linear equations.	1	2	2
	(c)	State Cayley-Hamilton theorem.	2	1	2
	(d)	Find the index and signature of the quadratic form $x^2 + 2y^2 - 3z^2$	2	3	2
	(e)	State Lagrange's Mean-Value theorem	3	1	2
	(f)	Verify Cauchy Mean-Value theorem for $f(x) = e^x$ in (a, b)	3	3	2
	(g)	Explain Leibnitz's rule for differentiation under integral sign	4	2	2
	(h)	Find $\frac{du}{dt}$, if $u = y^2 - 4ax$, $x = at^2$, $y = 2at$	4	3	2
	(i)	Express $\iiint_R f(x, y, z) dx dy dz$ in spherical polar co-ordinates	5	2	2
	(j)	Evaluate $\int_0^2 \int_0^4 (x^2 + y^2) dx dy$	5	3	2
5 x 10 = 50 Marks					
UNIT-1					
2.	(a)	Determine the rank of the matrix $\begin{pmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{pmatrix}$.	1	3	5
	(b)	Find whether the following equations are consistent. If so, solve them $x + y + 2z = 4$, $2x - y + 3z = 9$, $3x - y - z = 2$	1	3	5
OR					
3.	(a)	Using Gauss-Jordan method, find the inverse of the matrix $\begin{pmatrix} 3 & 1 & 1 \\ 2 & 2 & 1 \\ 1 & 4 & 5 \end{pmatrix}$	1	3	5

	(b)	Solve the equations $20x + y - 2z = 17$, $3x + 20y - z = -18$ and $2x - 3y + 20z = 25$ by Gauss-Seidel iteration method.	1	3	5
		UNIT-2			
4.	(a)	Find the characteristic equation of the matrix $A = \begin{pmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{pmatrix}$ and hence compute A^{-1} . Also find the matrix represented by $A^8 - 5A^7 + 7A^6 - 3A^5 + A^4 - 5A^3 + 8A^2 - 2A + I$	2	3	10
		OR			
5.		Reduce $6x^2 + 3y^2 + 3z^2 - 4xy - 2yz + 4xz$ to sum of squares by linear transformation and hence find the matrix of the transformation.	2	3	10
		UNIT-3			
6.	(a)	Verify Rolle's theorem for $\frac{\sin x}{e^x}$ in $(0, \pi)$	3	3	5
	(b)	Expand $f(x) = \cos x$ by Maclaurin's theorem with Lagrange's form of remainder.	3	3	5
		OR			
7.	(a)	Using Taylor's theorem, prove that $x - \frac{x^3}{6} < \sin x < x - \frac{x^3}{6} + \frac{x^5}{120}$, for $x > 0$	3	3	5
	(b)	Find the appropriate value of c used in Cauchy's Mean-Value theorem for $f(x) = \ln x$ in $[1, e]$	3	3	5
		UNIT-4			
8.	(a)	If $\log u = \frac{x^3 + y^3}{3x + 4y}$, find the value of $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$	4	3	5
	(b)	If $u = x + 3y^2 - z^3$, $v = 4x^2yz$, $w = 2z^2 - xy$, evaluate $\frac{\partial(u, v, w)}{\partial(x, y, z)}$ at $(1, -1, 0)$	4	3	5
		OR			
9.	(a)	Expand $x^2y + 3y - 2$ in powers of $(x-1)$ and $(y+2)$ using Taylor's theorem.	4	3	5
	(b)	Discuss the maxima and minima of $f(x, y) = x^3y^2(1 - x - y)$	4	3	5
		UNIT-5			

10.	(a)	Evaluate $\iint xy \, dx \, dy$ over the positive quadrant of the circle $x^2 + y^2 = a^2$ by changing it in to polar coordinates	5	3	5
	(b)	Evaluate $\int_0^\infty \int_0^x x e^{-\frac{x^2}{y}} \, dx \, dy$ by changing the order of integration	5	3	5
		OR			
11.		Find the volume of the sphere $x^2 + y^2 + z^2 = a^2$ by using triple integral.	5	3	10
		CO-COURSE OUTCOME	KL-KNOWLEDGE LEVEL	M-MARKS	

NOTE : Questions can be given as A,B splits or as a single Question for 10 marks



Course Code: B23BS1106					
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					R23
I B.Tech. I Semester MODEL QUESTION PAPER					
ENGINEERING CHEMISTRY					
CE &ME					
Time: 3 Hrs.			Max. Marks: 70 M		
Answer Question No.1 compulsorily					
Answer ONE Question from EACH UNIT					
Assume suitable data if necessary					
10 x 2 = 20Marks					
			CO	KL	M
1.	a).	The potential of a single electrode cannot be established. Why?	1	2	2
	b).	State two conditions for electrochemical corrosion to occur?	1	1	2
	c).	Why disodium salt of EDTA is much preferred than EDTA?	2	2	2
	d).	Name the chief sources of water?	2	1	2
	e).	What are the major constituents in composite materials?	3	2	2
	f).	Define the terms viscosity index, saponification?	3	1	2
	g).	How does vulcanization change the properties of natural rubber?	4	2	2
	h).	What is the role of ignition temperature in combustion of fuels?	4	2	2
	i).	Name any two methods to prepare Nano materials?	5	1	2
	j).	What is the principle of Bragg's method?	5	1	2
5 x 10 = 50Marks					
		UNIT-1	CO	KL	M
2.	a).	Why Calomel electrode can be used as reference electrode, describe the working of calomel electrode with reactions?	1	3	5
	b).	Write the principle and working of polymer electrolyte membrane fuel cells and discuss its advantages?	1	3	5
		OR			
3.	a).	How nature of the metal effect the rate of corrosion?	1	3	5
	b).	How metals can be protected from corrosion by Hot dipping method?	1	3	5
UNIT-2					
4.	a).	What is meant by Desalination of brackish water? How it is carried out by electro dialysis?	2	3	5
	b).	Why hard water is harmful for boilers, Explain the trouble sludge and scale formation in boilers?	2	3	5
		OR			

5.	a).	What are specifications for drinking water by Bureau of Indian standards (BIS) and world health organization (WHO)?	2	3	5
	b).	Explain briefly how dissolved oxygen found in water by Winkler's method?	2	3	5
UNIT-3					
6.	a).	Classify the composites based on reinforcement, briefly discuss the fiber reinforced composites?	3	3	5
	b).	What are the properties of refractories and why it is necessary to understand their properties?	3	3	5
OR					
7.	a).	Explain Flash point and Fire point with its significance?	3	3	5
	b).	Mention the main ingredients of Portland cement and briefly explain its manufacturing?	3	3	5
UNIT-4					
8.	a).	Write name of monomers of the following polymers and classify them as addition or condensation polymers- Bakelite, Styrene?	4	3	5
	b).	Explain briefly how can we prepare PVC by the mechanism of Chain growth polymerization?	4	3	5
OR					
9.	a).	Define calorific value. Explain Higher & Lower calorific value in detail?	4	3	5
	b).	How to calculate % of C, H and S through Ultimate analysis and write their significance?	4	3	5
UNIT-5					
10.	a).	What are colloids? Explain their synthesis by Bragg's method?	5	3	5
	b).	Briefly explain the Carbon nanotubes with properties and applications?	5	3	5
OR					
11.	a).	How Nano materials can be prepared by Chemical precipitation method?	5	3	5
	b).	What is the role of stabilizing agents for the stabilization of Nano materials?	5	3	5

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE : Questions can be given as A,B splits or as a single Question for 10 marks

Course Code: B23CE1101					
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					R23
I B.Tech. I Semester MODEL QUESTION PAPER					
BASIC CIVIL AND MECHANICAL ENGINEERING					
AIDS, AIML, CE, CSBS, CSG, CIC & ME					
Time: 3 Hrs.			Max. Marks: 70 M		
PART-A: BASIC CIVIL ENGINEERING					
Answer Question No.1 compulsorily					
Answer ONE Question from EACH UNIT					
Assume suitable data if necessary					
5x 1= 5 Marks					
			CO	KL	M
1.	a).	Write about the difference between structural engineering and geo-technical engineering in terms of their primary focus and objectives.	1	2	1
	b).	Explain the advantages of using steel as a construction material.	1	2	1
	c).	Explain the importance of accuracy and precision in surveying.	2	2	1
	d).	Explain the importance of tunnels in transportation infrastructure.	3	2	1
	e).	Explain the concept of hydrology and its role in water resources management.	3	2	1
3x 10 = 30 Marks					
UNIT-1					
2.	a).	Explain the significance and responsibilities of civil engineers within society?	1	3	5
	b).	List and briefly describe at least three major disciplines within civil engineering.	1	3	5
OR					
3.	a).	Explain the significance of construction materials in civil engineering projects. List three essential construction materials and their applications.	1	3	5
	b).	Explain the concept of prefabricated construction and its benefits in detail, highlighting at least two advantages of using prefabricated components in construction projects?	1	3	5
UNIT-2					
4.	a).	Explain the primary objective of surveying and demonstrate two practical applications of this field.	2	3	5

	b).	List and briefly describe two commonly used levelling instruments in surveying. Explain when you would use each of them.	2	3	5
		OR			
5.	a).	Explain the difference between true bearing and magnetic bearing. Why is it important to account for magnetic declination?	2	3	5
	b).	Explain how a digital elevation model (DEM) is used in modern contour mapping and list the advantages of using it compared to traditional methods.	2	3	5
		UNIT-3			
6.	a).	Explain the significance of transportation in a nation's economic development. Provide two examples of how efficient transportation systems contribute to economic growth.	3	3	5
	b).	List and briefly describe the different types of highway pavements commonly used in transportation engineering. Include their primary characteristics and applications.	3	3	5
		OR			
7.	a).	List and describe the primary sources of water for domestic, industrial, and agricultural use. Explain the importance of each source.	3	3	5
	b).	Explain the role of dams in water resources management and list the types of dams based on their structure, providing a brief introduction to each type.	3	3	5
PART-B: BASIC MECHANICAL ENGINEERING					
Answer Question No.1 compulsorily					
Answer ONE Question from EACH UNIT					
Assume suitable data if necessary					
5 x 1 = 5 Marks					
			CO	KL	M
1.	a).	What are smart materials.	1	1	1
	b).	What is meant by Machining	2	1	1
	c).	Write the 4 strokes of IC engine	2	1	1
	d).	List out the advantages of chain drives	3	2	1
	e).	What are the different types of joints used in robots	3	1	1
3 x 10 = 30 Marks					
UNIT-1					
2.	a).	Elaborate the Role of Mechanical Engineering in society and in different sectors	1	3	5

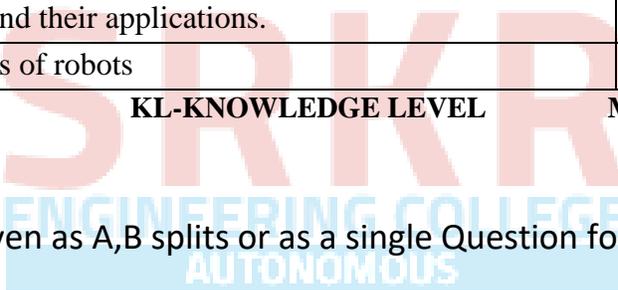
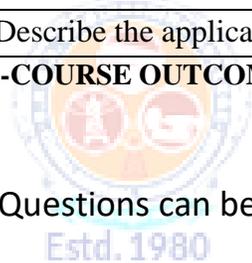
	b).	Illustrate the technologies used in automotive and aerospace industries	1	3	5
		OR			
3.	a).	What are the engineering applications of composite materials.	1	2	5
	b).	Briefly discuss the classification of metallic materials.	1	2	5
		UNIT-2			
4.	a).	Briefly discuss the Principles of Casting	2	2	5
	b).	Discuss the importance of 3D printing and Smart manufacturing	2	2	5
		OR			
5.	a).	Distinguish between the 2-Stroke and 4-Stroke engines	2	2	5
	b).	Illustrate the working principle of Cochran Boiler.	2	3	5
		UNIT-3			
6.	a).	Explain the working principle of Steam power plant	3	2	5
	b).	Discuss the working principle of nuclear power plant	3	2	5
		OR			
7.	a).	Discuss the belt drives and their applications.	3	2	5
	b).	Describe the applications of robots	3	2	5

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE : Questions can be given as A,B splits or as a single Question for 10 marks



Course Code: B23ME1101								
SAGIRAMAKRISHNAMRAJUENGINEERINGCOLLEGE(A)					R23			
I B.Tech I Semester-MODELQUESTION PAPER								
ENGINEERING GRAPHICS								
CE, ECE, EEE & ME								
Time:3Hrs.			Max.Marks:70					
Answer any one Question from Each Unit								
All questions carry equal Marks								
Assume suitable data if necessary								
		UNIT-I				CO	KL	M
1		Construct a parabola when the distance of the focus from directrix is 50mm. Also draw the tangent and normal at any point on the curve.				1	3	14
		OR						
2		A circle of 50mm diameter rolls along a straight line without slipping. Draw the curve traced out by a point P on the circumference, for one complete revolution of the circle. Draw a tangent and normal at any point on the curve.				1	3	14
		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	3	7
	b.	The front view of a line, inclined at 30° to the V.P is 65mm long. Draw the projections of a line when it is parallel to and 40mm above the H.P, its one end being 30mm in front of the V.P.				2	3	7
		OR						
4		A line AB, of 80 mm long has its end A, 15 mm in front of VP and 20mm above HP. The other end B is 40mm above HP and 50mm in front of VP. Draw the projections of the line and determine the inclinations of the line with HP and VP.				2	3	14
		UNIT-III						
5		Draw the projections of a regular hexagon of 25mm side, having one of its sides in the H.P and inclined at 60° to the V.P, and its surface making an angle of 45° with the H.P.				3	3	14
		OR						
6		Draw the projections of a regular pentagon of 40mm side, having its				3	3	14

	surface inclined at 30° to the H.P and side parallel to the H.P and inclined at an angle of 60° to the V.P.			
	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	3	14
	OR			
8	Draw the projections of a pentagonal prism, base 25mm side and axis 50mm long, resting on one of its rectangular faces on the H.P, with the axis inclined at 45° to the V.P.	4	3	14
	UNIT-V			
9	A square pyramid, base 40mm side and axis 65mm long, has its base on the H.P and all the edges of the base equally inclined to the V.P. It is cut by a section plane, perpendicular to the V.P, inclined at 45° to the H.P and bisecting the axis. Draw the sectional top view and true shape of the section.	5	3	14
	OR			
10	Draw the isometric projection of a cylinder of base diameter 30mm and axis height 60mm when axis is a) Horizontal and b) Vertical.	5	3	14

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

Estd. 1980

AUTONOMOUS

NOTE: Questions can be given as **a, b** splits or as a single Question for 14 marks

Course Code: B23BS1201					
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					R23
I B.Tech. II Semester MODEL QUESTION PAPER					
DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS					
Common to all Programmes of Engineering					
Time: 3 Hrs.			Max. Marks: 70 M		
Answer Question No.1 compulsorily					
Answer ONE Question from EACH UNIT					
Assume suitable data if necessary					
10 x 2 = 20 Marks					
			CO	KL	M
1.	(a)	Define Leibnitz's Linear differential equation. What is the Integrating factor of homogeneous differential equation $Mdx + Ndy = 0$	1	1	2
	(b)	Define the orthogonal trajectories of the family of curves.	1	1	2
	(c)	Solve $(D^2 + 4D + 4)y = 0$	2	3	
	(d)	Find the particular integral of $(D^2 + 1)y = \cos x$	2	3	2
	(e)	Form a P.D.E from $z = ax + by + c$	3	3	2
	(f)	Write the standard form of Lagrange's linear equation.	3	1	2
	(g)	Determine ∇r where $r = \sqrt{x^2 + y^2 + z^2}$	4	3	2
	(h)	If $\vec{F} = xy^2\vec{i} + 2x^2yz\vec{j} - 3yz^2\vec{k}$ find $\text{div } \vec{F}$ at $(1, -1, 1)$	4	3	2
	(i)	Write the formula for work done by a force \vec{F} in moving a particle from a point A to a point B.	5	2	2
	(j)	State Stoke's theorem.	5	1	2
5 x 10 = 50 Marks					
UNIT-1					
2.	(a)	Solve $\frac{dy}{dx} - \frac{2y}{x+1} = (x+1)^3$	1	3	5
	(b)	Solve $y \log y dx + (x - \log y)dy = 0$	1	3	5
OR					
3.	(a)	If the air is maintained at 30°C and the temperature of the body cools from 100°C to 70° C in 15 minutes, determine the time at which the temperature of the body will be 40° C.	1	3	5
	(b)	Find the orthogonal trajectories of the family of parabolas $y = ax^2$	1	3	5
UNIT-2					
4.	(a)	Solve $(D - 2)^2y = 8(e^{2x} + x^2)$	2	3	5
	(b)	Solve by the method of variation of parameters $\frac{d^2y}{dx^2} + y = \tan x$	2	3	5
OR					

5.	(a)	Solve simultaneous equations $\frac{dx}{dt} + y = \sin t$, $\frac{dy}{dt} + x = \cos t$, given that $x = 2$ and $y = 0$ when $t = 0$	2	3	5
	(b)	The damped LCR circuit is governed by the differential equation $L \frac{d^2q}{dt^2} + R \frac{dq}{dt} + \frac{q}{c} = 0$ where L, C, R are positive constants. Find the critical resistance.	2	3	5
UNIT-3					
6.	(a)	Solve the equation $x(y-z)p + y(z-x)q = z(x-y)$.	3	3	5
	(b)	Solve $(D - D' - 1)(D - D' - 2)z = e^{2x-y}$	3	3	5
OR					
7.		Solve $(D^2 - D'^2)z = e^{x+y} \sin(x+2y)$	3	3	10
UNIT-4					
8.	(a)	Find the directional derivative of $f = xy + yz + zx$ in the direction of vector $\vec{i} + 2\vec{j} + 2\vec{k}$ at the point $(1, 2, 0)$.	4	3	5
	(b)	If $\vec{F} = 3x^2\vec{i} + 5xy^2\vec{j} + 5xyz^3\vec{k}$, find $\nabla(\nabla \cdot \vec{F})$	4	3	5
OR					
9.	(a)	Prove that $(y^2 - z^2 + 3yz - 2x)\vec{i} + (3xz + 2xy)\vec{j} + (3xy - 2xz + 2z)\vec{k}$ is solenoidal.	4	3	5
	(b)	Find the angle between the surfaces $xy^2z = 3x + z^2$ and $3x^2 - y^2 + 2z = 1$ at the point $(1, -2, 1)$	4	3	5
UNIT-5					
10.	(a)	Find the work done by the force field $\vec{F} = (2x + y^2)\vec{i} + xz\vec{j} + xyz\vec{k}$ in moving a particle along a straight line from $(0,0,0)$ to $(2,1,3)$.	5	3	5
	(b)	Evaluate $\oint_C \{(x^2y dx + x^2dy)\}$ where C is circle $x^2 + y^2 = a^2$ by using Green's theorem.	5	3	5
OR					
11		Verify Gauss – divergence theorem for $\vec{F} = 2xz\vec{i} + yz\vec{j} + z^2\vec{k}$ where S is an upper half of the sphere $x^2 + y^2 + z^2 = a^2$	5	3	10

COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE: Questions can be given as **a, b** splits or as a single Question for 10 marks

Course Code: B23BS1202					
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					R23
I B.Tech. II Semester MODEL QUESTION PAPER					
ENGINEERING PHYSICS					
AIDS, AIML, CE, CSBS, CSG, CIC & ME					
Time: 3 Hrs.			Max. Marks: 70 M		
Answer Question No.1 compulsorily					
Answer ONE Question from EACH UNIT					
Assume suitable data if necessary					
10 x 2 = 20Marks					
			CO	KL	M
1.	a).	State the Principle of Superposition.	1	1	2
	b).	Explain the double refraction phenomena of light.	1	2	2
	c).	What are lattice parameters?	2	2	2
	d).	Draw the lattice planes with Miller Indices (100) and (111).	2	2	2
	e).	What do you understand by polar and nonpolar dielectrics?	3	1	2
	f).	Define relative permeability, magnetic susceptibility and give their relation?	3	2	2
	g).	State the Heisenberg's uncertainty principle.	4	1	2
	h).	Define Fermi energy?	4	1	2
	i).	What are extrinsic semiconductors?	5	2	2
	j).	List out the characteristic properties of semiconductors.	5	2	2
5 x 10 =50Marks					
UNIT-1					
2.	a).	Elaborate the essential conditions for producing sustained interference of light.	1	2	4
	b).	How are Newton's rings formed and deduce an expression for the wavelength of light?	1	3	6
OR					
3.	a).	Analyze the diffraction of light at a single slit and obtain the condition for maxima.	1	4	6
	b).	What are Half wave plate and Quarter wave plate and mention their applications?	1	2	4
UNIT-2					
4.	a).	Define Packing fraction of atomic crystals and calculate the Packing fraction for an FCC lattice?	2	3	5

	b).	What are Miller indices and explain how they are determined?	2	3	5
		OR			
5.	a).	Deduce the Bragg's X-ray diffraction condition?	2	3	5
	b).	Describe the Laue's method for the determination of crystal structure.	2	3	5
		UNIT-3			
6.	a).	Explain the different types of Polarizations possible in dielectrics.	3	2	4
	b).	Deduce the Clausius-Mosotti equation and explain its significance in dielectrics?	3	3	6
		OR			
7.	a).	Classify the Magnetic materials based on atomic magnetic moment.	3	2	4
	b).	Describe the hysteresis exhibited by a ferromagnetic material and explain it using a suitable theory.	3	3	6
		UNIT-4			
8.	a).	Obtain the Schrodinger's time independent wave equation.	4	3	6
	b).	Calculate deBroglie wavelength of an electron moving with a velocity of $1/20^{\text{th}}$ of the velocity of light?	4	3	4
		OR			
9.	a).	Give an account of successes and failures of classical free electron theory.	4	2	4
	b).	Obtain an expression for the electrical conductivity of a metal using Quantum free electron theory.	4	3	6
		UNIT-5			
10.	a).	Derive an expression for the density of electrons in the conduction band of an intrinsic semiconductor?	5	3	6
	b).	Describe the variation of Fermi energy with temperature and dopant concentration in n-type semiconductor.	5	2	4
		OR			
11.	a).	Discuss the Hall effect, in detail, and explain its significance.	5	3	6
	b).	Distinguish between drift and diffusion currents in semiconductors.	5	2	4
		COURSE OUTCOME	KL-KNOWLEDGE LEVEL	M-MARKS	

NOTE: Questions can be given as **a, b** splits or as a single Question for 10 marks

Course Code: B23EE1201					
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					R23
I B.Tech. II Semester MODEL QUESTION PAPER					
BASIC ELECTRICAL & ELECTRONICS ENGINEERING					
AIDS, AIML, CE, CSBS, CSG, CIC & ME					
Time: 3 Hrs.			Max. Marks: 70 M		
PART – A: BASIC ELECTRICAL ENGINEERING					
Answer Question No.1 compulsorily					
Answer ONE Question from EACH UNIT					
Assume suitable data if necessary					
5 x 1 = 5 Marks					
			CO	KL	M
1.	a).	Define Ohm's law.	1	1	1
	b).	Define Impedance.	1	1	1
	c).	List types of wind turbines	2	1	1
	d).	State two advantages of renewable energy sources?	2	1	1
	e).	List types of earthing methods.	3	1	1
3 x 10 = 30 Marks					
UNIT-1					
2.	a).	Explain Kirchhoff's Laws with example	1	3	5
	b).	Calculate the equivalent resistance R_{ab} at terminals a-b for the given circuit.	1	3	5
OR					
3.	a).	Derive the expression RMS value of sinusoidal wave form $v(t) = V_m \sin \omega t$.	1	3	5
	b).	Explain (i) Active power (ii) Reactive power (iii) Apparent power in ac circuits.	1	3	5
UNIT-2					
4.	a).	Illustrate the working of solar power plant with a neat layout.	2	3	5
	b).	Explain principle of operation transformer.	2	3	5
OR					
5.		Illustrate the principle of working of a PMMC instrument with neat	2	3	10

		diagram.			
		UNIT-3			
6.	a).	Explain the construction and principle of DC motor with neat sketch.	3	3	5
	b).	Derive the torque equation for DC Motor.	3	3	5
		OR			
7.	a).	Illustrate about the construction details and operation of a miniature circuit breaker (MCB)?	3	3	5
	b).	Sketch and explain Pipe Earthing method?	3	3	5
PART – B: BASIC ELECTRONICS ENGINEERING					
Answer Question No.1 compulsorily					
Answer ONE Question from EACH UNIT					
Assume suitable data if necessary					
5 x 1 = 5 Marks					
			CO	KL	M
1.	a).	List the applications of Zener diode.	1	1	1
	b).	Draw the diagram of NPN and PNP transistors.	1	1	1
	c).	Define Rectifier.	2	1	1
	d).	Convert binary number to decimal number ,1011 ₂ to (-----) ₁₀	3	2	1
	e).	Write Truth table of NAND gate.	3	1	1
3 x 10 = 30 Marks					
		UNIT-1	CO	KL	M
2.	a).	Explain the operation of PN junction Diode and draw the V-I characteristics.	1	3	5
	b).	Illustrate the operation of Zener Diode and draw its Characteristics.	1	3	5
		OR			
3.		Draw and explain the input and output characteristics of a transistor in CE configuration	1	3	10
		UNIT-2			
4.	a).	Illustrate the operation of Half wave rectifier with neat sketch.	2	3	5
	b).	Explain how the Zener diode acts as a voltage regulator.	2	3	5
		OR			
5.	a).	Draw the circuit diagram of Full wave rectifier and explain its operation.	2	3	5
	b).	Draw the block diagram of an electronic instrumentation system and explain its working.	2	3	5

		UNIT-3			
6.	a).	Write the Truth Tables of Logic Gates – NOT, OR, AND, NOR and NAND	3	3	5
	b).	Convert the following number system into indicated system. i) $(256)_{10} = (\dots\dots\dots)_2$ ii) $(F32C)_{16} = (\dots\dots\dots)_{10}$	3	3	5
		OR			
7.	a).	Solve the Boolean expressions using Boolean algebra, Show: $AB'C+B+BD'+ABD'+A'C=B+C$	3	3	5
	b).	Draw and explain the Full adder circuit using half adders.	3	3	5

CO-COURSE OUTCOME

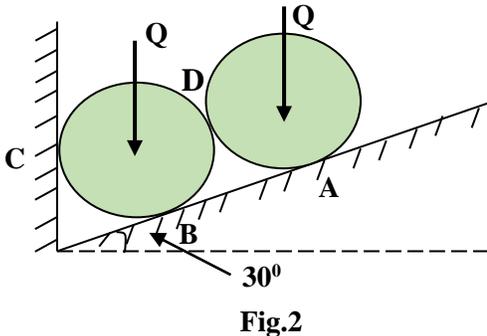
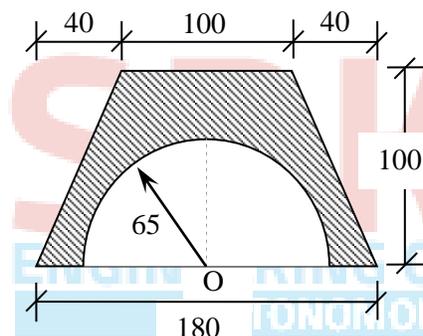
KL-KNOWLEDGE LEVEL

M-MARKS

NOTE: Questions can be given as **a, b** splits or as a single Question for 10 marks



Course Code: B23ME1203					
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					R23
I B.Tech. II Semester MODEL QUESTION PAPER					
ENGINEERING MECHANICS					
CE & ME					
Time: 3 Hrs.			Max. Marks: 70 M		
Answer Question No.1 compulsorily					
Answer ONE Question from EACH UNIT					
Assume suitable data if necessary					
10 x 2 = 20 Marks					
			CO	KL	M
1.	a).	Distinguish between scalar and vector quantities.	1	2	2
	b).	State Varignon's theorem.	1	1	2
	c).	Distinguish between centroid and Centre of gravity.	2	2	2
	d).	State the perpendicular axis theorem.	2	1	2
	e).	Write the difference between perfect truss and imperfect truss.	3	2	2
	f).	State laws of friction.	3	1	2
	g).	State law of conservation of momentum.	4	1	2
	h).	State D' Alembert's Principle.	4	1	2
	i).	State work energy principle.	5	1	2
	j).	Define plane motion with help of a neat sketch.	5	1	2
5 x 10 = 50 Marks					
		UNIT-1			
2.	a).	Determine the resultant and its position of the force system shown in Fig 1. <div style="text-align: center;"> <p>Fig. 1</p> </div>	1	3	6
	b).	Two forces act at an angle of 120° . The bigger force is 40 N and the resultant is perpendicular to the smaller force. Determine the smaller force.	1	3	4
OR					

3.	<p>Two identical rollers, each weighting $Q = 100 \text{ N}$ are supported by an inclined plane and a vertical wall as shown in Fig. 2. Applying conditions of equilibrium, determine the reactions at points of support A, B and C. Assuming the surfaces are smooth.</p>  <p>The diagram shows two identical green rollers. The left roller is in contact with a vertical wall at point C and an inclined plane at point B. The right roller is in contact with the inclined plane at point A. Both rollers have a downward weight force labeled Q. The inclined plane makes a 30-degree angle with the horizontal. The contact point between the two rollers is labeled D.</p> <p style="text-align: center;">Fig.2</p>	1	3	10
UNIT-2				
4.	<p>Determine the centroid of hatched region as shown in Fig. 3. (All dimensions are in cm.)</p>  <p>The diagram shows a hatched trapezoidal region with a semi-circular cutout. The top width is 180 cm, divided into three segments of 40 cm, 100 cm, and 40 cm. The bottom width is 180 cm. The height of the trapezoid is 100 cm. A semi-circular cutout is centered on the bottom edge with a radius of 65 cm. The center of the semi-circle is labeled O.</p> <p style="text-align: center;">Fig. 3</p>	2	3	10
OR				
5.	<p>Determine the Moment of Inertia about its centroidal axes of the composite area shown below in Fig. 4. (All dimensions are in mm).</p>	2	3	10

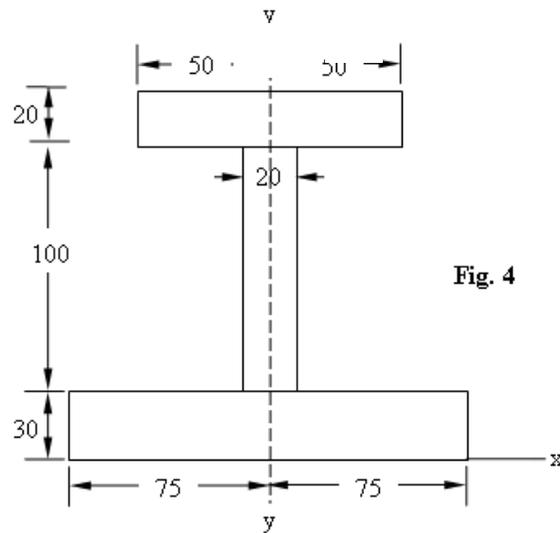


Fig. 4

UNIT-3

A block weighing 150 N is resting on another block B of weight 250 N and tied to the wall by a rope as shown in Fig. 5. The block B is resting on horizontal floor. The static friction between blocks A and B is 0.2 and between block B and floor is 0.25. A force P whose inclination with horizontal is 30° , is applied to block B such that motion impends. Find the magnitude of forces P and tension in the rope.

6.

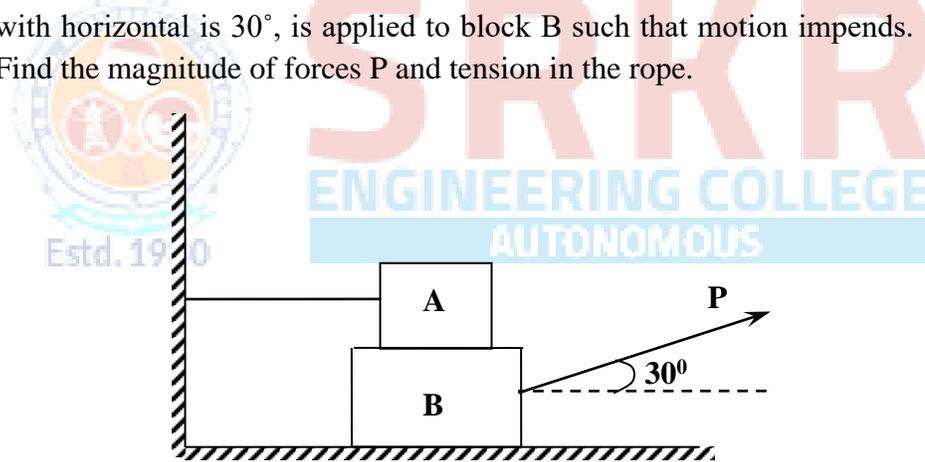


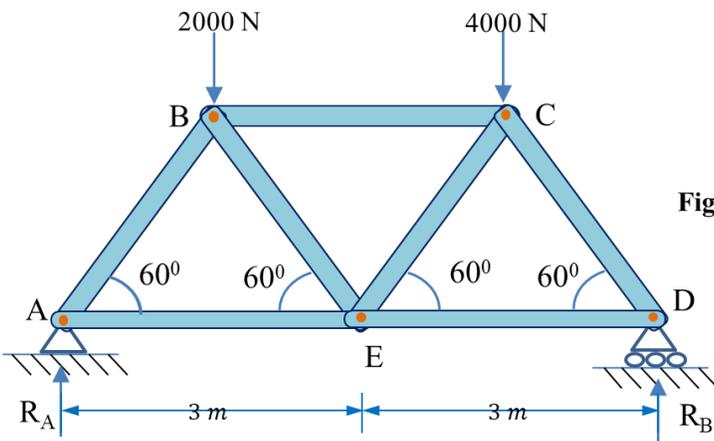
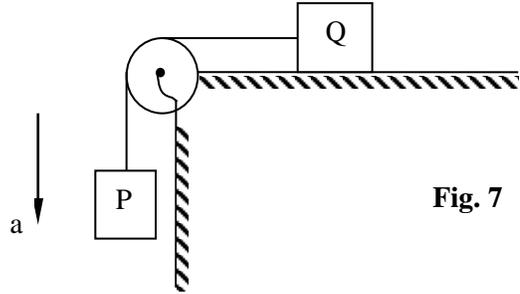
Fig. 5

OR

3

3

10

7.	<p>Determine forces in all members of the truss shown in Fig. 6 below.</p>  <p style="text-align: right;">Fig. 6</p>	3	3	10
UNIT-4				
8.	<p>a). A stone dropped into a well and is heard to strike the water after 4 seconds. Determine the depth of the well, if velocity of the sound is 350 m/s.</p>	4	3	5
	<p>b). A particle starting from rest, moves in a straight line, whose equation of motion is given by: $S = t^3 - 2t^2 + 3$. Determine the velocity and acceleration of the particle after 5 seconds.</p>	4	3	5
OR				
9.	<p>Referring to Fig 7 below, find the acceleration of a falling weight P, if the coefficient of friction between the block Q and the horizontal plane on which it slides is μ. Neglect the inertia of the pulley and friction. Assume $P=10\text{kg}$, $Q=12\text{kg}$ and $\mu=1/3$.</p>  <p style="text-align: right;">Fig. 7</p>	4	3	10
UNIT-5				
10.	<p>A flywheel rotates with a constant retardation due to braking. From $t = 0$ to $t = 10$ seconds, it made 300 revolutions. At time $t = 7.5$ sec, its angular velocity was 40π rad/sec. Determine</p> <ol style="list-style-type: none"> The value of constant retardation Total time taken to come to rest and Total revolutions made till it comes to rest. 	5	3	10

		OR			
11.		<p>A solid cylindrical pulley of mass 800 kg, having 0.8 m radius of gyration and 2 m diameter, is rotated by an electric motor, which exerts a uniform torque of 60 kN-m. A body of mass 3 tons is to be lifted by a wire wrapped round the pulley.</p> <p>Determine</p> <p>i) Acceleration of the body and</p> <p>ii) Tension in the rope.</p>	5	3	10
CO-COURSE OUTCOME		KL-KNOWLEDGE LEVEL	M-MARKS		

NOTE: Questions can be given as **a, b** splits or as a single Question for 10 marks



Course Code: B23CS1201					
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					R23
I B.Tech. II Semester MODEL QUESTION PAPER					
INTRODUCTION TO PROGRAMMING					
CE, ECE, EEE & ME					
Time: 3 Hrs.			Max. Marks: 70 M		
Answer Question No.1 compulsorily					
Answer ONE Question from EACH UNIT					
Assume suitable data if necessary					
10 x 2 = 20Marks					
			CO	KL	M
1.	a).	Find the output of the following code: <pre>#include <stdio.h> int main(void) { int i = 1, j = 0, k; k = (i & j) + (i j) + (i ^ j) + !i + j; printf("%d", k); return 0; }</pre>	1	3	2
	b).	Differentiate pre and post increment with an example.	1	3	2
	c).	Show an example for continue statement in a loop.	2	2	2
	d).	Give an example for event-controlled loop.	2	2	2
	e).	Write a code snippet to print alternate elements of a one-dimensional array of n integers.	3	2	2
	f).	Apply nested loops and write a code snippet to find the sum of all elements of a two-dimensional array of size n x m.	3	3	2
	g).	State the disadvantages of pointers.	4	1	2
	h).	Identify the operations are not allowed on pointers?	4	2	2
	i).	Write a macro to find the largest of two numbers. Use conditional operator.	5	3	2
	j).	Find the output of the following code:	5	3	2

		<pre> #include <stdio.h> int main(void) { FILE *f = fopen("file","w"); int i; fputs("12A",f); fclose(f); f = fopen("file","r"); fscanf(f,"%d",&i); fclose(f); printf("%d",i); return 0; } </pre>			
5 x 10 =50Marks					
		UNIT-1	CO	KL	M
2.	a).	Draw a flow chart to find the largest of three numbers.	1	3	5
	b).	Explain operator precedence and associativity with two examples.	1	3	5
		OR			
3.	a).	List all the bitwise operators and give one example for each with numerical values represented in binary.	1	3	5
	b).	Write a C program to calculate simple and compound interest. Given the term in months.	1	3	5
		UNIT-2			
4.	a).	Differentiate while and do-while loops with an example for each.	2	3	5
	b).	Write a C program to check if the given number is prime or not. Use for loop.	2	3	5
		OR			
5.	a).	Write a C program to find the sum of individual digits of a given integer number.	2	3	5
	b).	Use switch case to find the grade of a student given the marks. Show five grades. A, B, C, D, E and F for fail. If the marks are less than 40 then the grade is fail.	2	3	5
		UNIT-3			
6.	a).	Write a C program to sort the given array using bubble sort.	3	3	5
	b).	List any five string handling functions and show its usage.	3	2	5
		OR			
7.	a).	Write a C program to implement string concatenation of two strings str1 and str2, store the result in str3. (Do not use string function)	3	3	5
	b).	Develop C program to find the transpose of a matrix.	3	3	5

		UNIT-4			
8.	a).	Explain about structures and pointers. How can you access elements of a structure using its pointer notation. Discuss with an example.	4	3	5
	b).	Differentiate structures and unions.	4	2	5
		OR			
9.	a).	Apply bit fields and write a C program to demonstrate its use.	4	3	5
	b).	Write a C program to copy one structure variable to another structure of the same type	4	3	5
		UNIT-5			
10.	a).	Differentiate malloc and calloc with an example program.	5	3	5
	b).	Explain the storage classes in C.	5	2	5
		OR			
11.	a).	Write a C program to copy the contents of file1 to file2.	5	3	5
	b).	Discuss the random file access functions in C.	5	2	5

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE: Questions can be given as **a, b** splits or as a single Question for 10 marks

