Q.P. Code: 917012 | **SET - 1**

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

B. Tech. I Sem. (R15) Supple. Examinations of February/March - 2021

SUB: Environmental Studies (EEE, ECE & CSE)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Define the environment and why is environmental awareness is important?	7M
	(b)	Write detailed notes on Energy Resources.	7M
		(OR)	
2.	(a)	What are the 5 most important natural resources? And discuss their associated problems on environment.	7M
	(b)	What are the negative effects of modern agriculture and overgrazing?	7M
		UNIT – II	
3.	(a)	Elaborate an example of the interaction between abiotic and biotic resources.	7M
	(b)	What is food chain and food web explain with diagram?	7M
		(OR)	
4.	(a)	Why is the desert important to the ecosystem?	7M
	(b)	What is difference between primary and secondary ecological successions?	7M
		UNIT – III	
5.	(a)	What are the aesthetic values and productive values of biodiversity?	7M
	(b)	Enumerate the major threats to biodiversity?	7M
		(OR)	
6.	(a)	Write short notes on biodiversity at Global, National and Local level.	7M
	(b)	What is the main risk associated with endemic species?	7M
		UNIT – IV	
7.	(a)	What is meant by pollution? What is the role of an individual in prevention of pollution?	7M
	(b)	What are the causes effects and control measures of water pollution?	7M
		(OR)	
8.	(a)	What are the causes of solid waste management?	7M
	(b)	What are the different types of disaster management? What is the role of management?	7M
		UNIT-V	
9.	(a)	What are the major problems related to rehabilitation of the displaced people?	7M
	(b)	Write about the role of Information Technology in Environment and Human health.	7M
		(OR)	
10.	(a)	What are the current practices for wasteland reclamation?	7M
	(b)	What is Water Pollution Act 1974?	7M

Q.P. Code: 917212 **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R15) Supple. Examinations of February/March - 2021
SUB: Programming in C (EEE, ECE & CSE)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT – I

1.	(a)	Define algorithm. Write an algorithm for find factorial of a given number.	7M
	(b)	Explain generations of computer languages.	7M
		(OR)	
2.	(a)	Explain System development steps.	10M
	(b)	Define identifier. What are the rules for identifiers in C.	4M
		UNIT – II	
3.	(a)	Explain Structure of C Program.	8M
	(b)	Explain type conversion with an example.	6M
		(OR)	
4.	(a)	Explain operator precedence and associativity with example.	8M
	(b)	Write a C program read two integers num1 and num2, and find which is biggest and which is smallest.	6M
		UNIT – III	
5.	(a)	Explain precondition and post condition loops with example programs.	8M
	(b)	Write a C program to find sum and average of 1 to n numbers.	6M
		(OR)	
6.		What are the different types of user defined functions? Explain with examples.	14M
		UNIT – IV	
7.	(a)	What is an array? Explain declaration and initialization of two dimensional array.	7M
	(b)	Write a C program to read two matrices and perform addition of two matrices.	7M
		(OR)	
8.	(a)	Explain any four string handling (manipulation) functions with examples.	8M
	(b)	Write a C program to find given key element is in the array or not using Linear Search.	6M
		UNIT-V	
9.	(a)	Define Structure. Explain declaration and initialization of structures with example.	7M
	(b)	What are the differences between structures and unions?	7M
		(OR)	
10.	(a)	Define pointer and explain accessing of different data types.	7M
	(b)	Explain the following operators: i) Logical bitwise operators ii) sizeof()	7M

Q.P. Code: 917412 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R15) Supple. Examinations of February/March - 2021
SUB: Engineering Graphics (EEE, ECE & CSE)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. A fixed point is 50mm away from a fixed straight line. Draw the curve and name it, when the eccentricity is 3/2. Draw a tangent and normal at any point on the curve. **14M**

(OR)

2. **(a)** Construct an Ellipse with distance of the focus from the directrix as 50mm and eccentricity 2/3. **8M**

(b) Draw the involute of an equilateral triangle of side 20mm and draw a normal and a tangent at a distance 60mm from the center of the triangle. **6M**

UNIT – II

3. **(a)** A line AB 50mm long has its end A in both H.P and V.P. It is inclined at 30 deg to the H.P and at 45 deg to V.P. Draw its Projections? **8M**

(b) Two points A and B are on H.P, the point A being 30mm in front of V.P, while B is 45mm behind V.P. The line joining their top views makes an angle 45 deg with xy. Find the horizontal distance between the two points? **6M**

(OR)

4. **(a)** A line PQ 75mm long is inclined at 45 deg to H.P and 30 deg to V.P. Its end P is in H.P and 40 mm infront of V.P. Draw its Projections? **8M**

(b) The top view of 80mm long line measures 55mm. The line is in V.P. Its one end is 15mm above H.P. Draw its projections? **6M**

UNIT – III

5. **(a)** A square lamina of 40mm side has one side on H.P. Its plane is inclined at 45 deg to H.P and perpendicular to V.P. Draw its projections? **6M**

(b) Draw the projections of an equilateral triangle of 30mm side with its surface making an angle of 50 deg with H.P and one of its corners is in H.P and 25mm away from V.P **8M**

(OR)

6. **(a)** Draw the projections of a cylinder of 40mm diameter and axis 60mm long when it is lying on the ground with its axis inclined at 45 deg to H.P and parallel to V.P? **10M**

(b) A square prism, base 30mm side and height 60mm is resting on HP on one of its rectangular faces with axis perpendicular to VP. Draw its projections? **4M**

UNIT – IV

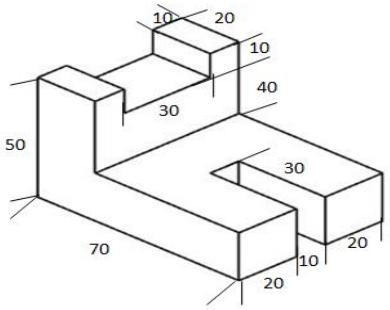
7. A pentagonal pyramid of side of base35mm and axis 60mm long, stands with its base on H.P, such that one of the base edges is perpendicular to V.P. A section plane is parallel to VP cuts the solid at a distance of 15mm from the corner of the base which is nearer to the observer? Draw the projections of the solid? Also draw the sectional front view of the cut solid? **14M**

(OR)

8. A cone with diameter of base 50mm and axis 60mm long, is resting on its base on H.P. It is cut by a section plane inclined at 45 deg to H.P and passing through the axis at appoint 35mm above H.P. Draw the projections of the Solid? Draw the true shape of the section? **14M**

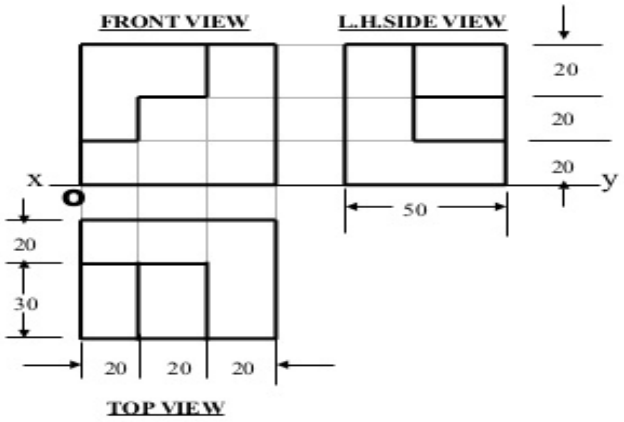
UNIT-V

9. Draw the (a) Front view and (b) Top View of the following Isometric figure? **14M**



(OR)

10. Draw the Isometric view of the following Orthographic views? **14M**



O.P. Code: 917612 | **SET - 1**

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

B. Tech. I Sem. (R15) Supple. Examinations of February/March - 2021

SUB: Mathematics-II (Common to EEE, ECE & CSE)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Find curl $\bar{f}$ where $\bar{f} = grad(x^3 + y^3 + z^3 - 3xyz)$ **7M**

(b) Find constants a, b, c so that the vector $\bar{A} = (x + 2y + az)\bar{i} + (bx - 3y - z)\bar{j} + (4x + cy + 2z)\bar{k}$ is irrotational. Also find ϕ such that $\bar{A} = \nabla\phi$. **7M**

(OR)

2. Verify Green's theorem for $\int_c [(3x^2 - 8y^2)dx + (4y - 6xy)dy]$ where c is the region bounded by $x = 0, y = 0$ and $x + y = 1$. **14M**

UNIT – II

3. (a) Find the Laplace transform of $t\cos at$ **7M**

(b) Evaluate $\int_0^\infty te^{-2t}\sin t dt$ **7M**

(OR)

4. Find the Laplace transform of $f(t) = \begin{cases} 1, 0 \prec t \le 1 \\ t, 1 \prec t \le 2 \\ 0, t \succ 2 \end{cases}$ **14M**

UNIT – III

5. (a) Find the inverse Laplace transform of $\frac{s^2}{(s-2)^3}$ **7M**

(b) Apply Convolution theorem to evaluate $L^{-1}\left[\frac{s}{(s^2 + a^2)^2}\right]$ **7M**

(OR)

6. Use transform method to solve $\frac{d^2x}{dt^2} - 2\frac{dx}{dt} + x = e^t$ with $x = 2, \frac{dx}{dt} = -1$ at $t = 0$ **14M**

UNIT – IV

7. Find the Fourier series to represent $f(x) = x^2 - 2$, when $-2 \le x \le 2$ **14M**

(OR)

8. (a) Find half -range Fourier sine series for $f(x) = ax + b$, in $0 \prec x \prec 1$. **7M**

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

UNIT-V

9. (a) Form the partial differential equation by eliminating a and b from the equation $z = ax + by + a^2 + b^2$ **7M**

(b) Solve $u_{xx} = u_y + 2u$ with $u(0, y) = 0$ and $\frac{\partial u(0, y)}{\partial x} = 1 + e^{-3y}$. **7M**

(OR)

10. A tightly stretched string with fixed end points $x = 0$ and $x = l$ is initially in a position given by $y = y_0 \sin^3 \frac{\pi x}{l}$. If it is released from rest from this position, find the displacement $y(x, t)$. **14M**

Q.P. Code: 917812 **SET - 1**

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

B. Tech. I Sem. (R15) Supple. Examinations of February/March - 2021

SUB: Human Values and Professional Ethics (CE & ME)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	What is meant by inquiry? Explain various types of inquiries.	7M
	(b)	Write a note on Consensus and Controversy.	7M

(OR)

2.	(a)	Discuss the importance of engineering ethics to become an ideal engineer in the society.	7M
	(b)	Define morals and values. Elaborate and give an example each	7M

UNIT – II

3.		Explain in detail about standards to be maintained by an Engineer in order to make a Successful project, within the limitations of norms and ethics.	14M

(OR)

4.		Explain how an engineer would learn from the past designs and experiments.	14M

UNIT – III

5.	(a)	Analyze job related risks in detail.	7M
	(b)	Discuss the importance of designing for safety.	7M

(OR)

6.	(a)	Explain the attitude of consumers in considering the safety of a product.	7M
	(b)	Write a note on Risk benefit analysis.	7M

UNIT – IV

7.		Define collegiality. Discuss the techniques for achieving collegiality.	14M

(OR)

8.		What is meant by conflicts of interest? How are conflicts of interest solved?	14M

UNIT-V

9.		Explain the importance of computer ethics.	14M

(OR)

10.		Write a note on the following: i)Business ethics ii) Leadership	14M

Q.P. Code: 918012 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R15) Supple. Examinations of February/March - 2021
SUB: Engineering Drawing - I (CE & ME)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. Construct a parabola, with the distance of the focus from the directrix as 50mm. Also, draw normal and tangent to the curve, at a point 40mmfrom the directrix. **14M**

(OR)

2. Draw the involute of a regular hexagon of side 20mm. Draw a tangent and normal to the curve at a distance of 100mm from the centre of the hexagon. **14M**

UNIT – II

3. A point P is 15mm above HP and 20mm in front of VP. Another point Q is 25mm behind VP and 40mm below HP. Draw the projections of P and Q , keeping the distance between the projectors equal to 90mm. Draw straight lines, joining the top views and the front views. **14M**

(OR)

4. A line CD measuring 80mm is inclined at an angle of 30^0 to HP and 45^0 to VP. The point c is 20mm above HP and 30mm in front of VP. Draw the projections of the straight line. **14M**

UNIT – III

5. A pentagonal lamina of 35mm side has a circular hole of 35mm diameter in its center. The plane stands on one of its sides on HP with one side perpendicular to VP and 45^0 inclined to HP. Draw the projections. **14M**

(OR)

6. A semi-circular plate of 80 mm diameter has its straight edge on V.P. and inclined at 30^0 to H.P., while the surface of the plate is inclined at 45^0 to V.P. Draw the projections of the plane **14M**

UNIT – IV

7. A hexagonal prism, side of base 25mm and axis 60mm long, lies with one of its rectangular faces on HP, such that the axis is inclined at 45^0 to VP. Draw its projections. **14M**

(OR)

8. A hexagonal pyramid side of base 25mm, axis 50mm long lies with one of its triangular faces on the HP and its axis is parallel to the VP. Draw its projections. **14M**

UNIT-V

9. A cylinder with diameter of base 50 mm and axis 60 mm long is resting on its base on H.P. It is cut by a section plane inclined at 45^0 to HP and passing through the axis point 30 mm above the H.P. Draw the projections of the cut solid and obtain the true shape of the section. **14M**

(OR)

10. A pentagonal prism, side of base 25mm and axis 60mm long, rests with its base on HP. It is cut by a section plane at a distance of 35mm from its base at angle of 30^0. Draw the sectional top view and true shape of the section. **14M**

Q.P. Code: 918212 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R15) Supple. Examinations of February/March - 2021
SUB: English - I (Common to all Branches)

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

Answer any FIVE Questions
All questions carry Equal Marks.

1. Give a detailed account of the lesson ***Building a New State*** by Dr. APJ Abdul Kalam. **14 M**

2. Describe the theme of R.K.Narayan's short story ***An Astrologer's Day***. **14 M**

3. "Mokshagundam Visveswaraya's vision and engineering skills contributed to the development of modern India". Elucidate. **14 M**

4. Define 'Diphthong'. Write the phonemic symbols of all the Diphthongs giving two example words for each. **14 M**

5. Write a paragraph on any **TWO** of the topics given below: **14 M**
(i) My favourite Mobile phone
(ii) My role model
(iii) My hobby

6. What advice does the father give to his son in the poem ***If*** by Rudyard Kipling? **14 M**

7. (a) Give **one** synonym for each of the following: **7M**
(i) Precious (ii) Collaborate (iii) Chide (iv) Concise (v) Fright (vi) Zeal

(b) Give **one** antonym for each of the following: **7M**
(i) Rise (ii) Sharp (iii) Ordinary (iv) Generous (v) Overt (vi) Credit (vii) Dull

8. **Answer the following:** **14 M**

(i) I prevented him to enter the office. (correct the sentence)

(ii) His problems are the same as me. (correct the sentence)

(iii) Everybody _____ Ram has come. (Accept/Except)

(iv) _____ book is this? (who's / whose)

(iv) A workman who fits and repairs pipes. (supply one word substitute)

(v) Custom of having many wives. (supply one word substitute)

(vi) He will look into your case. (change from active to passive voice)

(vii) Where did he find the pen? (change from active to passive voice)

(viii) He gave a gift _____ his daughter. (use suitable preposition)

(ix) Who are you afraid _____ ? (use suitable preposition)

(x) He put his arm _____ her. (use suitable preposition)

(xi) _____ stitch in time saves nine. (The/A/An) (use appropriate article)

(xii) _____ Bible is a sacred book. (The/A/An) (use appropriate article)

(xiii) _____father in him forgave the son. (The/A/An) (use appropriate article)

(xiv) He is _____ M.B.A degree holder. (The/A/An) (use appropriate article)

Q.P. Code: 918412 | **SET - 1**

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

B. Tech. I Sem. (R15) Supple. Examinations of February/March - 2021

SUB: Engineering Chemistry (CE & ME)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	**(a)**	Explain Zeolite (or) Permutit process for treatment of water.	**8M**
	(b)	Give the reactions involved in Phosphate conditioning & Calgon conditioning.	**6M**
		(OR)	
2.	**(a)**	Calculate temporary, permanent and total hardness of a sample of water containing the following in ppm $Ca(HCO_3)_2$=16.2, $Mg(HCO_3)_2$=14.6, $CaSO_4$=13.6, $MgSO_4$=12	**8M**
	(b)	**W**rite the definitions of Carbonate and Non- Carbonate hardness.	**6M**
		UNIT – II	
3.	**(a)**	Differentiate condensation and addition polymerization with suitable examples	**7M**
	(b)	What is Bakelite? Give the preparation method& properties and uses?	**7M**
		(OR)	
4.	**(a)**	Write a note on Cationic mechanism of polymer formation	**7M**
	(b)	Give the preparation, properties & uses of Silicone Rubber.	**7M**
		UNIT – III	
5.	**(a)**	Explain the working of methanol fuel cell?	**7M**
	(b)	Derive the Nernst equation for a electrochemical cell.	**7M**
		(OR)	
6.	**(a)**	Give the only chemical reaction involved in methanol- Oxygen cell	**7M**
	(b)	Explain the charging, dis-charging reactions of Lithium –ion batteries	**7M**
		UNIT – IV	
7.	**(a)**	Explain the process of refining of petroleum	**8M**
	(b)	Define Gross Calorific Value (GCV),Net Calorific Value(NCV) & Relationship between GCV&NCV.	**6M**
		(OR)	
8.	**(a)**	Write about properties of lubricating oils and its applications	**7M**
	(b)	Explain the mechanism of thick film lubrication	**7M**
		UNIT-V	
9.	**(a)**	Write a short note on (i) Catalytic promoters (ii) Catalytic poisons	**7M**
	(b)	Write a notes on Fluorescence	**7M**
		(OR)	
10.	**(a)**	Explain Homogeneous catalysis with suitable example	**7M**
	(b)	Discuss the Significance of green chemistry for sustainable development	**7M**

Q.P. Code: 918612 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R15) Supple. Examinations of February/March - 2021
SUB: Engineering Physics (CE & ME)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	**(a)**	What is interference? What are the conditions to get interference?	4M
	(b)	Describe the construction and working of Nd-YAG laser?	10M
		(OR)	
2.	**(a)**	What are the characteristics of the laser?	4M
	(b)	Describe the formation of Newton's rings with necessary theory?	10M
		UNIT – II	
3.	**(a)**	What are the Miller indices? Draw the planes for the following Miller indices (110), (100), and (111).	6M
	(b)	Mention the properties and detection of ultrasonic waves?	8M
		(OR)	
4.	**(a)**	Describe the production of ultrasonic waves by piezoelectric method?	8M
	(b)	State and explain Bragg's law of X-ray diffraction?	6M
		UNIT – III	
5.	**(a)**	Derive Schronder's time independent wave equation?	10M
	(b)	Explain the origin of energy bands in solids?	4M
		(OR)	
6.	**(a)**	Describe Kronig-Penny model to understand the behavior of electrons in a varying periodic potential field of a crystal?	10M
	(b)	What are properties of matter waves?	4M
		UNIT – IV	
7.	**(a)**	Define the magnetic moment and explain the origin of magnetic moment at the atomic level?	10M
	(b)	Explain Meissner effect?	4M
		(OR)	
8.	**(a)**	What is superconductivity? Distinguish type I and type II superconductors	8M
	(b)	Distinguish soft and hard magnetic materials?	6M
		UNIT-V	
9.	**(a)**	Describe the synthesis of nanomaterials by sol-gel method?	10M
	(b)	The R_H of a specimen is 3.66×10^{-4} m^3c^{-1}. Its resistivity is 8.93×10^{-3} Ω-m. Find mobility (μ) of charge carriers?	4M
		(OR)	
10.	**(a)**	Describe possible extrinsic semiconductors with its Fermi energy levels?	10M
	(b)	Mention applications of nanomaterials?	4M

Q.P. Code: 918812 | **SET - 1**

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

B. Tech. I Sem. (R15) Supple. Examinations of February/March - 2021

SUB: Mathematics-I (Common to all Branches)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	**(a)**	Solve $\frac{dy}{dx} + x\sin 2y = x^3 \cos^2 y$	**9 M**
	(b)	Solve $xdy - ydx = x\sqrt{x^2 - y^2}\,dx$	**6 M**
		(OR)	
2.	**(a)**	Find the orthogonal trajectories of the family of coaxial circles $x^2 + y^2 + 2gx + c$, g being the parameter.	**7 M**
	(b)	A body originally at 80^0c cools down to 60^0 c in 20 minutes, the temperature of the air being 40^0 c. What will be the temperature of the body after 40 minutes from the original?	**7 M**

UNIT – II

3.	**(a)**	Find the general solution of $(D^2 - 4D + 4)^2 y = 8(e^{2x} + \sin 2x + x^2)$	**10 M**
	(b)	Find the particular integral of $(D^2 - 4D + 3)y = e^x \cos 2x$	**4 M**
		(OR)	
4.	**(a)**	Solve $D^2 y + 4y = 4\tan 2x$ by using the method of variation of parameters	**7 M**
	(b)	Solve $D^2 y + y = \cos ecx$ by the method of variation of parameters.	**7 M**

UNIT – III

5.	**(a)**	Using Maclaurin's series, expand sinx upto terms containing x^5	**7 M**
	(b)	If $x = u(1-v), y = uv$ prove that $JJ' = 1$	**7 M**
		(OR)	
6.	**(a)**	A rectangular box open at the top is to have volume of 32 cubic ft. find the dimensions of the requiring least material for its construction.	**10 M**
	(b)	Discuss the maximum and minimum of $x^2 + y^2 + 6x + 12$	**4 M**

UNIT – IV

7.	**(a)**	Find the radius of curvature of the curve $xy^2 = a^3 - x^3$ at the point $(a, 0)$	**7 M**
	(b)	Find the coordinates of the centre of curvature at any point of the parabola $y^2 = 4ax$	**7 M**
		(OR)	
8.		Trace the curve $y^2(a-x) = a + x$	**14 M**

UNIT-V

9.		Evaluate $\int\int (x^2 + y^2)dxdy$ over the area bounded by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$	**14 M**
		(OR)	
10.		Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyz\,dxdydz$	**14 M**