

8/2/2023(M)


SOMAIYA
 VIDYAVIHAR UNIVERSITY

Semester: October 2022 – January 2023		
Maximum Marks: 100	Examination: ESE Examination	Duration:3 Hrs.
Programme code: 06	Class: FY	Semester: I (SVU 2020)
Programme: B. Tech		
Name of the Constituent College: K. J. Somaiya College of Engineering		Name of the department: COMP/IT/EXCP/EXTC/MECH
Course Code: 116U06C101	Name of the Course: Applied Mathematics-I	
Instructions: 1) Draw neat diagrams 2) All questions are compulsory		
3) Assume suitable data wherever necessary		

Que. No.	Question	Max. Marks
Q1	Solve any Four of the following	20
i)	If α, β are the roots of the equation $x^2 - 2x + 2 = 0$, prove that $\alpha^n + \beta^n = 2.2^{n/2} \cos n\pi/4$. Hence, deduce that $\alpha^8 + \beta^8 = 32$	5
ii)	Is the matrix $A = \begin{bmatrix} \sqrt{2} & 1 & \sqrt{3} \\ \sqrt{2} & -2 & 0 \\ \sqrt{2} & 1 & -\sqrt{3} \end{bmatrix}$ orthogonal? If not, can it be converted into orthogonal matrix?	5
iii)	Check whether the vectors $X_1 = [1 \ 1 \ 1]$, $X_2 = [1 \ 2 \ 4]$, $X_3 = [-2 \ 3 \ 8]$ are linearly dependent or independent.	5
iv)	Find Eigen values of $A = \begin{bmatrix} 2 & 2 & 2 \\ 2 & 2 & 2 \\ 2 & 2 & 2 \end{bmatrix}$ and hence find Eigen values of A^{10}	5
v)	If $u = f(x^2 - y^2, y^2 - z^2, z^2 - x^2)$, prove that $\frac{1}{x} \frac{\partial u}{\partial x} + \frac{1}{y} \frac{\partial u}{\partial y} + \frac{1}{z} \frac{\partial u}{\partial z} = 0$.	5
vi)	If $u = x^2 \tan^{-1} \frac{y}{x} + y^2 \sin^{-1} \frac{x}{y}$, prove that $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2} = 2u$	5
Q2 A	Solve the following	10
i)	Solve the equation $7 \cosh x + 8 \sinh x = 1$ for real values of x	5
ii)	If $x = e^u \tan v$, $y = e^u \sec v$, prove that $\left(x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}\right) \left(x \frac{\partial v}{\partial x} + y \frac{\partial v}{\partial y}\right) = 0$	5
OR		
Q2 A	Find the Eigenvalues and Eigenvectors of matrix $A = \begin{bmatrix} -9 & 4 & 4 \\ -8 & 3 & 4 \\ -16 & 8 & 7 \end{bmatrix}$	10
Q 2 B	Solve any One of the following	10
i)	Find the value of k (unknown) such that following homogeneous system of equations will have non-trivial solutions and find solution for each such value of k . $3x + y - kz = 0$, $4x - 2y - 3z = 0$, $2kx + 4y + kz = 0$	10
ii)	If $u = f(r)$, $r^2 = x^2 + y^2 + z^2$, prove that $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = f''(r) + \frac{2}{r} f'(r)$.	10

Q3	Solve any Two of the following	20
i)	A) Find the values of p for which the following matrix A will have (i) rank 1, (ii) rank 2, (iii) rank 3, where $A = \begin{bmatrix} p & 2 & p \\ p & p & 2 \\ 2 & p & p \end{bmatrix}$	05
	B) If $u = \sinh^{-1} \left(\frac{x^3+y^3}{x^2+y^2} \right)$, prove that $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2} = -\tanh^3 u$	05
ii)	If $A = \begin{bmatrix} -1 & 4 \\ 2 & 1 \end{bmatrix}$ then prove that $3 \tan A = A \tan 3$	10
iii)	If $\tan z = \frac{i}{2}(1-i)$, prove that $z = \frac{1}{2} \tan^{-1} 2 + \frac{i}{4} \log \left(\frac{1}{5} \right)$	10
Q4	Solve any Two of the following	20
i)	Reduce the following matrix to the Normal form and find it's rank $\begin{bmatrix} 2 & -4 & 3 & 1 & 0 \\ 1 & -2 & 1 & -4 & 2 \\ 0 & 1 & -1 & 3 & 1 \\ 4 & -7 & 4 & -4 & 5 \end{bmatrix}$	10
ii)	Check whether the matrix $A = \begin{bmatrix} 1 & -6 & -4 \\ 0 & 4 & 2 \\ 0 & -6 & -3 \end{bmatrix}$ is diagonalisable or not. If Yes then find the transforming matrix M and the diagonal matrix D	10
iii)	A rectangular box open at the top is to have a volume of 108 cubic meters. Find the dimensions of the box if its total surface area is minimum.	10
Q5	Solve any Four of the following	20
i)	Solve $x^7 + x^4 + x^3 + 1 = 0$	5
ii)	Find the principal value of $(1+i)^{1-i}$	5
iii)	Solve the following equations by Gauss - Seidel method (2 iterations) $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$	5
iv)	Find the minimal polynomial of the matrix $A = \begin{bmatrix} 5 & -6 & -6 \\ -1 & 4 & 2 \\ 3 & -6 & -4 \end{bmatrix}$. Comment whether A is derogatory or not?	5
v)	If $u = xyz, v = x^2 + y^2 + z^2, w = x + y + z$, then find $\frac{\partial(u,v,w)}{\partial(x,y,z)}$ and hence using property find $\frac{\partial(x,y,z)}{\partial(u,v,w)}$	5
vi)	Verify Euler's Theorem for $u = ax^2 + 2hxy + by^2$	5



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Semester: August 2022 – December 2022		
Maximum Marks: 100	Examination: ESE Examination	Duration: 3 Hrs.
Programme code: Q6 Programme: B. Tech.	Class: F. Y. B. Tech	Semester: I (SVU 2020)
Name of the Constituent College: K. J. Somaiya College of Engineering		Name of the department: EXTC/IT/MECH/COMP/EXCP.
Course Code: 116U06C102	Name of the Course: Engineering Physics	
Instructions: 1) Draw neat diagrams 2) All questions are compulsory		
3) Assume suitable data wherever necessary.		
4) Values of the constants are given at the end of the Q. papers.		

Que. No.	Question	Max. Marks
Q1	Solve any Four	20
i)	Write Maxwell's equations in differential form and mention their physical significance.	5
ii)	State the scalar magnetometer. Explain how the Hall effect can be used for measurement of magnetic field.	5
iii)	Describe Davission -Germer experiment to verify De Broglie hypothesis	5
iv)	Obtain the expression for path difference between two reflected rays in thin transparent film.	5
v)	Show that for an intrinsic semiconductor, $E_F = (E_C + E_V)/2$ where symbols have their usual meaning.	5
vi)	Show that energy levels of a particle in one dimensional infinite potential well are quantized	5

Que. No.	Question	Max. Marks
Q 2 A	Solve the following	10
i)	A drop of oil of volume 0.2 cc is dropped on the surface of a tank water of area 1 sq. m. The film spreads uniformly over the whole surface. White light which is incident normally on the surface is observed through spectroscope. The spectrum is seen to contain one dark band whose centre has wavelength 5500 Å in air. Find the refractive index of the given oil.	5
ii)	Define – absorption, spontaneous emission, stimulated emission, metastable state, population inversion.	5
	OR	
Q 2 A	What is polarization. State and explain Malus Law. Calculate the Brewster angle for i) ethyl alcohol for which $\mu = 1.361$ and carbon tetra chloride for which $\mu = 1.461$.	10
Q 2 B	Solve any One	10
i)	Using Heisenberg's Uncertainty Principle, show that electron cannot exist within the nucleus. A position and momentum of 1 keV electron are simultaneously measured. If position is located within 10 nm then what is the percentage uncertainty in its momentum?	10
ii)	Derive one dimensional Time Dependent Schrodinger equation for matter waves. An electron is trapped in a one dimensional box of length 0.1 nm. Calculate the energy required to excite the electron from its ground state to the	10

	4 th excited state.	
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Que. No.	Question	Max. Marks
Q3	Solve any Two	20
i)	Derive the expression for numerical aperture for a step index optical fibre. Find the core radius necessary for single mode operation at 850 nm in step index fibre with $n_1 = 1.480$ and $n_2 = 1.47$. What is the numerical aperture and maximum acceptance angle of this fibre.	10
ii)	Define drift current, diffusion current and mobility of charge carriers. The resistivity of intrinsic InSb at room temperature is 2×10^{-4} ohm-cm. If the mobility of electron is $6 \text{ m}^2/\text{V-sec}$ and mobility of hole is $0.2 \text{ m}^2/\text{V-sec}$, calculate its intrinsic carrier density.	10
iii)	Explain the statement – “Magnetic monopoles does not exist” using Maxwell’s equation. State Gauss law for electric field and derive first Maxwell’s equation.	10

Que. No.	Question	Max. Marks
Q4	Solve any Two	20
i)	State magnetostriction, piezoelectric and inverse piezoelectric effect. Explain various cuts of the quartz crystal which can be used in piezoelectric oscillators.	10
ii)	What are types of radiations? Define "sievert". How it is related with SAR value of radiation. Describe construction and working of a Geiger-Muller counter	10
iii)	What is gradient of a scalar field? What is its significance?. Find the curl and divergence of the vector function $F = (x+y)\mathbf{i} + (x+z)\mathbf{j} + (y-z)\mathbf{k}$ and show that the vector field is conservative. (i, j and k are the unit vectors along X, Y and Z axis)	10

Que. No.	Question	Max. Marks
Q5	(Write notes / Short question type) on any four	20
i)	i) Why do we see different colours from a thin oil film spread on the water surface? ii) Why excessively thin films appear black?	5
ii)	State and explain Clausius-Mossotti equation.	5
iii)	Explain de Broglie hypothesis of matter waves and deduce the expression for wavelength. State any two properties of matter wave.	5
iv)	State Gauss law for electric field. Derive first Maxwell’s equation.	5
v)	Define and explain Seebeck and Peltier effect.	5
vi)	List five types tropisms, explain any one in brief. What is differential growth in the plants?	5

constants:

- i) Speed of light $c = 3 \times 10^8 \text{ m/sec}$.
ii) Mass of electron $m_e = 9.1 \times 10^{-31} \text{ kg}$.
iii) Elementary charge $= 1.6 \times 10^{-19} \text{ C}$.
iv) Planck's constant $= 6.63 \times 10^{-34} \text{ Js}$.
v) Avogadro's No $= 6.024 \times 10^{26} / \text{mole}$.
vi) Boltzmann's constant $= 1.38 \times 10^{-23} \text{ J/K}$.
vii) Mass of proton $= 1.67 \times 10^{-27} \text{ kg}$.

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Semester: October 2022 – January 2023		Duration:3 Hrs.	
Maximum Marks: 100	Examination: ESE Examination		
Programme code: 01	Class:	Semester: I (SVU 2020)	
Programme: B.Tech	F.Y.B.Tech		
Name of the Constituent College:	Name of the department: All Branches		
K. J. Somaiya College of Engineering			
Course Code: 116U06C103	Name of the Course: Engineering Chemistry		
Instructions: 1)Draw neat diagrams 2) All questions are compulsory			
3) Assume suitable data wherever necessary 4) Atomic mass of Ca=40, Mg=24, C=12, O=16, N=14, S=32,			

Que. No.	Question	Max. Marks
Q1	Solve any Four	20
i)	'Prevention of waste' is important principles of green chemistry explain with suitable example.	5
ii)	Write the reactions during softening and regeneration in zeolite method. Give two advantages of zeolite method.	5
iii)	How Nano materials are classified explain using suitable examples.	5
iv)	Distinguish between addition and condensation polymerization	5
v)	Draw the neat labelled diagram for solar water heater and give three limitations of solar energy.	5
vi)	Calculate the absorbance & Molar absorptivity for the path length of 1.5 cm if the transmittance of 1.5×10^{-4} mol/dm ³ solution was found to be 60 %.	5
Q2 A	Solve the following	10
i)	Give functions and examples of any two ingredients used in molding of plastics.	5
ii)	Discuss any five characteristics of thermosetting polymers.	5
	OR	
Q2 A	Find number average, weight average and PDI of the polymer. If a poly disperse mixture of polymer contains 150 molecules of molecular weight 2500, 250 molecules of molecular weight 3000 and 300 molecules of molecular weight 500. Give four applications of biodegradable polymers.	10
Q2 B	Solve any One	10
i)	Explain with the help of diagram and reactions, softening of hard water by hot lime soda process. Give two advantages and limitations of lime soda process over zeolite process.	10
ii)	Define BOD and COD. Explain method to determine COD of effluent water using K ₂ Cr ₂ O ₇ titration. What is unit for its measurement and give the any three advantages of COD over BOD.	10
Q3	Solve any Two	20
i)	What is proximate analysis of coal? Explain method to determine percentage volatile matter and moisture present in coal. Discuss significance of determination % moisture and volatile matter (two points).	10

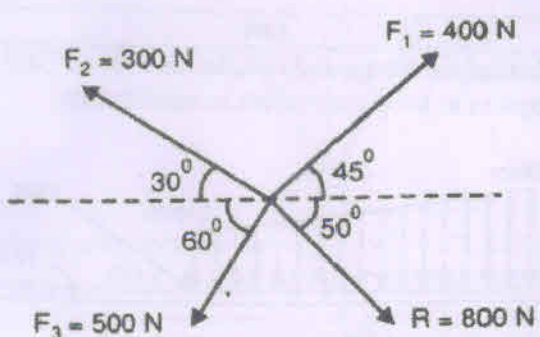
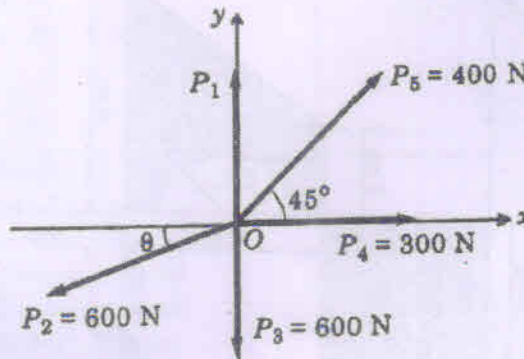
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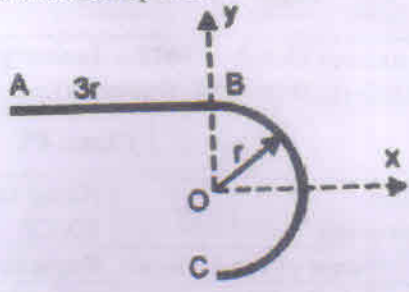
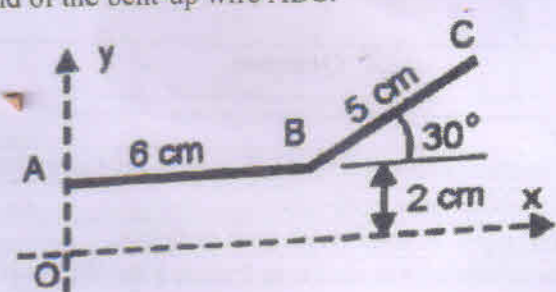
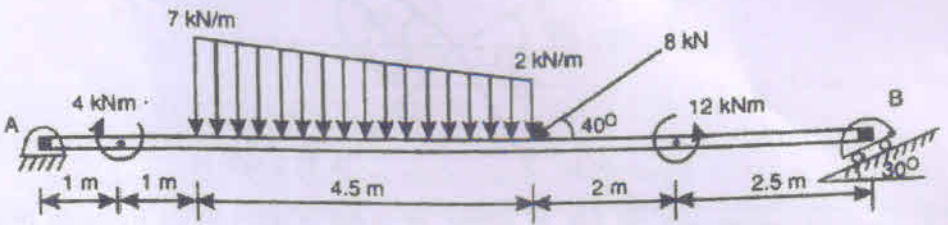
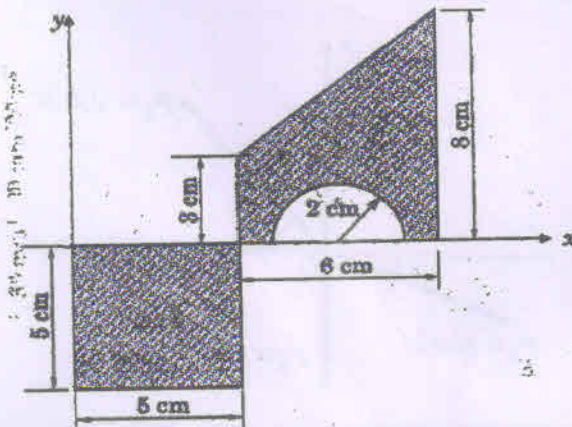
ii)	Explain cracking of oils with suitable example. Describe with help of schematic diagram for moving bed catalytic cracking. Write two advantages of moving bed catalytic cracking.	10
iii)	Define calorific value. What is difference between GCV and NCV of coal sample? Calculate, GCV and NCV of coal if it contains: C = 85 %, H = 6 %, O = 2 %, S = 2 %, N = 1 %. Ash= remaining.	10
Q4	Solve any Two	20
i)	What is principle of conductometric titration? With the help of representative titration curve explain the neutralization of strong acid and weak base using conductometric titrations.	10
ii)	What is mathematical formula for Beer- Lamberts law? What is unit for molar extinction coefficient? Explain with labelled diagram working of double beam spectrophotometer.	10
iii)	Calculate total number of fundamental modes of vibrations for CO ₂ & acetylene (C ₂ H ₂) molecule. Give IR frequencies for following functional group. a) O-H (hydrogen bonded) c) Alkyl C-H stretching b) Ether C-O-C d) Alkyl C-H bending	10
Q5	Solve or write a short note on any Four	20
i)	Caustic embrittlement	5
ii)	Applications of Nano materials in medicine	5
iii)	Kevlar Polymer	5
iv)	Solar photovoltaic cell	5
v)	Atom Economy	5
vi)	Objectives of Green Chemistry	5

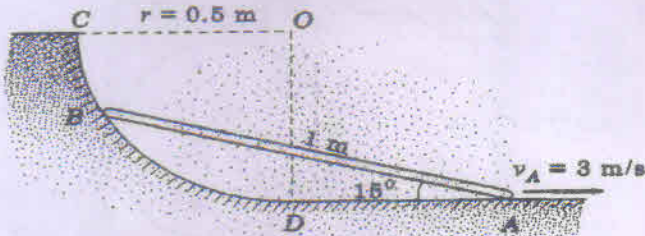
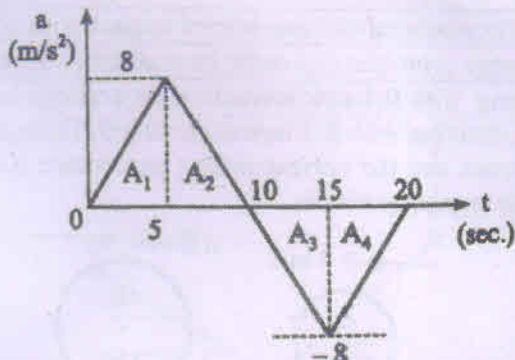
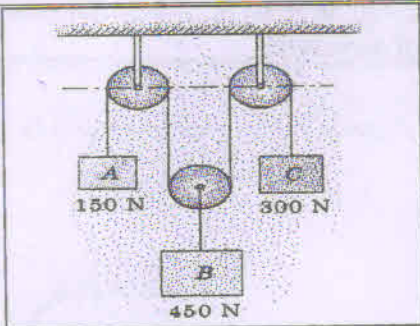
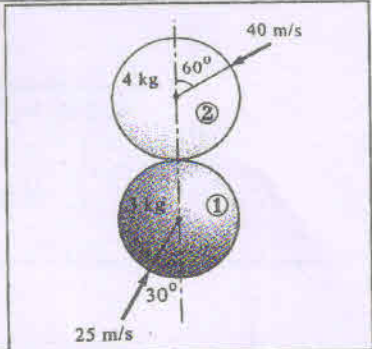
13.2.2023 (M)

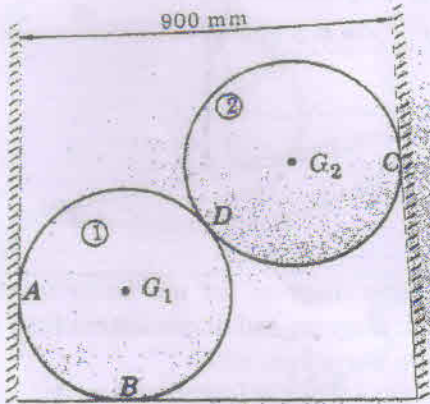
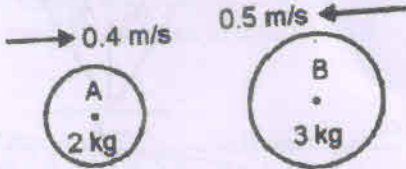

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Semester: October 2022 – January 2023		
Maximum Marks: 100	Examination: ESE Examination	Duration:3 Hrs.
Programme code: 01	Class: FY	Semester:I (SVU 2020)
Programme: B.Tech		
Name of the Constituent College:		Name of the department:COMP / IT / EXCP
K. J. Somaiya College of Engineering		
Course Code: 116U06C104	Name of the Course: Engineering Mechanics	
Instructions: 1)Draw neat diagrams 2) All questions are compulsory		
3) Assume suitable data wherever necessary		

Que. No.	Question	Max. Marks
Q1	Attempt any Four	20
i)	Describe angle of friction and cone of friction with neat sketches.	5
ii)	Discuss on elastic and inelastic collision.	5
iii)	Discuss on different types of loads with neat sketches.	5
iv)	<p>$R = 800 \text{ N}$ is the resultant of 4 concurrent forces. Find the fourth force F_4?</p> 	5
v)	A force of magnitude 50 kN is acting at point A (2,3,4) m towards point B (6,-2,-3) m. Find the moment of the given force about a point D (-1,1,2) m.	5
vi)	<p>If the resultant of five forces acting at point O is zero, determine the force P_1 and angle θ as shown in figure.</p> 	5

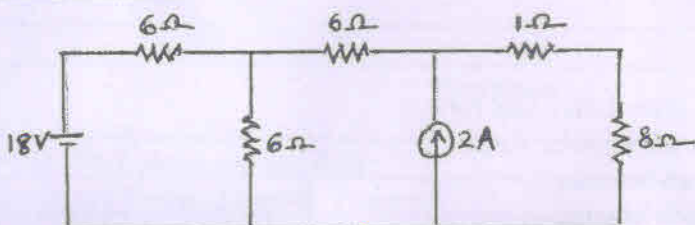
Q2 A	Solve the following	10
i)	Determine the centroid of the bent-up wire in terms of r .	5
		
ii)	Locate the centroid of the bent-up wire ABC.	5
		
OR		
Q2 A	The beam AB is loaded by forces and couples as shown. Find the reaction force offered by the supports to keep the system in equilibrium.	10
		
Q2 B	Solve any One	10
i)	Find the coordinates of centroid for the shaded area shown in figure.	10
		
ii)	State and prove Varignon's Theorem.	10

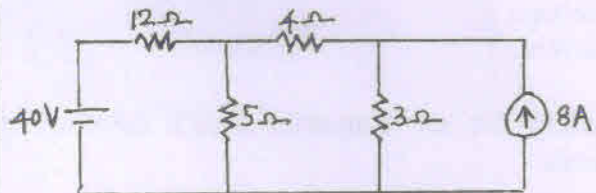
Q3	Solve any Two	20
i)	<p>Bar AB is 1 m long. End A of the bar moves with a velocity of 3 m/s on the horizontal plane. End B travels along circular path CD of radius 0.5 m. Find the velocity of B for the given position.</p> 	10
ii)	<p>For the acceleration time diagram for the linear motion is shown in figure. Construct velocity time diagram and displacement time diagram for the motion. Assume that the motion starts from rest. Solve the problem by motion curve (graphical) method. Also show type (nature) of each curve on all the diagrams.</p> 	10
iii)	<p>A particle moves along a hyperbolic path $\frac{x^2}{16} - y^2 = 28$. If the x-component of velocity is $V_x = 4$ m/s and remains constant, determine the magnitudes of particles velocity and acceleration when it is at point (32,6) m.</p>	10
Q4	Solve any Two	20
i)	<p>Three weights A, B and C are connected as shown in figure. Determine the acceleration of each weight and tension in the string. Given : $W_A = 150$ N , $W_B = 450$ N and $W_C = 300$ N.</p> 	10
ii)	<p>Two smooth balls of ball 1 of mass 3 kg and ball 2 of mass 4 kg are moving with velocities 25 m/s and 40 m/s respectively at an angle of 30° and 60° with the vertical as shown in figure. If coefficient of restitution between two balls is 0.8, find the magnitude and direction of velocities of these balls after impact.</p> 	10

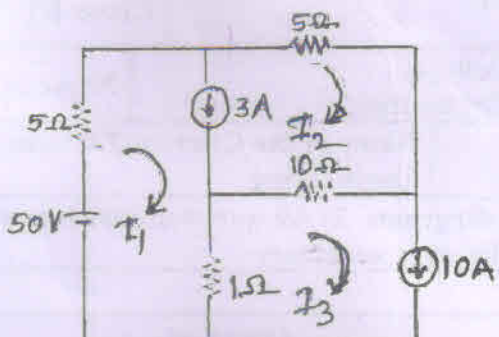
iii)	Two smooth spheres of weight 100 N and of radius 250 mm each are in equilibrium in a horizontal channel of width 900 mm as shown. Find the reaction at the surface of contact A, B, C and D, assuming all the surfaces to be smooth.	10
		
Q5	Attempt any four	20
i)	Discuss on Direct central and oblique central impact with neat sketches.	5
ii)	Explain Work energy principle and write its mathematical expression.	5
iii)	A 2 kg ball moving with 0.4 m/s towards right collides head on with another ball of mass 3 kg, moving with 0.5 m/s towards left. Determine the velocities of the balls after impact and the corresponding percentage loss of kinetic energy, when the impact is perfectly elastic.	5
		
iv)	Discuss on different types of supports with neat sketches.	5
v)	Discuss on laws of friction.	5
vi)	A particle travels on a circular path whose arc distance travelled is defined by $s = (0.5t^3 + 3t)$ m. If the total acceleration is 10 m/s^2 at $t = 2 \text{ sec.}$, find the radius of curvature?	5



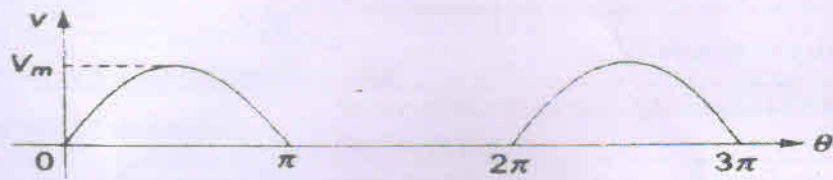
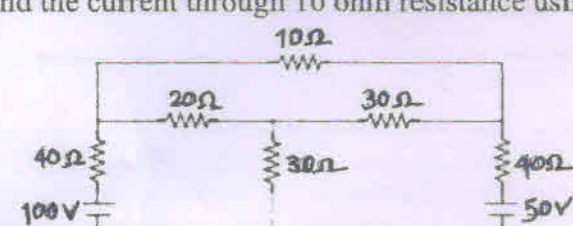
Semester: Oct. 2022 – Jan. 2023		
Maximum Marks: 100	Examination: ESE Examination	Duration: 3 Hrs.
Programme code: 06	Class: FY	Semester: I (SVU 2020)
Programme: B.Tech.		
Name of the Constituent College: K. J. Somaiya College of Engineering		Name of the department: COMP/IT
Course Code: 116U06C107	Name of the Course: Elements of Electrical and Electronics Engineering	
Instructions: 1) Draw neat diagrams 2) All questions are compulsory 3) Assume suitable data wherever necessary		

Que. No.	Question	Max. Marks
Q1	Solve any Four	20
i)	Find the value of current flowing through the 8 ohm resistor using Source Transformation. 	5
ii)	Explain current voltage characteristics of a PN junction diode.	5
iii)	Explain OPAMP as an inverting amplifier.	5
iv)	A coil having a resistance of 20 ohm and an inductance of 0.1 H is connected in series with a 50 microFarad capacitor. An alternating voltage of 250 V is applied to the circuit. At what value of frequency will the current in the circuit be maximum? What is the value of this current? Also find the voltage across the inductor and quality factor.	5
v)	What are the classifications of DC motors? Specify one application for each one	5
vi)	Explain the working principle of a single phase transformer.	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	10
i)	Find the value of current flowing through the 4 ohm resistor using the Superposition theorem. 	5
ii)	Compare BJT and FET	5

	OR	
Q2 A	Give the comparison between half wave, full wave and bridge rectifier.	10
Q 2 B	Solve any One	10
i)	<p>Determine the power delivered by the voltage source and the current in the 10 ohm resistor of the below network using mesh analysis.</p> 	10
ii)	<p>Two impedances, $14 + j5$ ohm and $18 + j10$ ohm, are connected in parallel across 200 V, 50 Hz, single phase supply.</p> <p>Determine:</p> <ul style="list-style-type: none"> (i) Admittance of each branch in polar form. (ii) Current in each branch in polar form. (iii) Power factor of each branch. (iv) Active power in each branch. (v) Reactive power in each branch. 	10

Que. No.	Question	Max. Marks
Q3	Solve any Two	20
i)	Compare CE, CB and CC configurations of BJT.	10
ii)	Explain the construction and working principle of the 3 phase induction motor.	10
iii)	<p>A balanced load of phase impedance 100 ohm and power factor 0.8 (lag) is connected in delta to a 400 V, 3-phase supply.</p> <p>Calculate: (i) Phase current and line current. (ii) Active power and reactive power.</p> <p>If the load is reconnected in star across the same supply,</p> <p>find (iii) Phase voltage and line voltage. (iv) Phase current and line current.</p> <p>What will be the wattmeter readings for star connected load if the power is measured by two wattmeter methods ?</p>	10

Que. No.	Question	Max. Marks
Q4	Solve any Two	20
i)	Draw and explain phasor diagram of a transformer for lagging power factor load.	10
ii)	Find the Average and RMS value of the waveform shown in figure.- 	10
iii)	Find the current through 10 ohm resistance using Thevenin's theorem. 	10

Que. No.	Question	Max. Marks
Q5	Write short notes on any four	20
i)	Maximum Power Transfer Theorem.	5
ii)	Zener Diode as a Voltage Regulator.	5
iii)	Voltage Regulation of a transformer.	5
iv)	Q- Factor and Bandwidth in 1 phase AC Circuit.	5
v)	OPAMP as a Comparator.	5
vi)	Capacitor Start Induction Motor.	5

15.2.2023 (M)

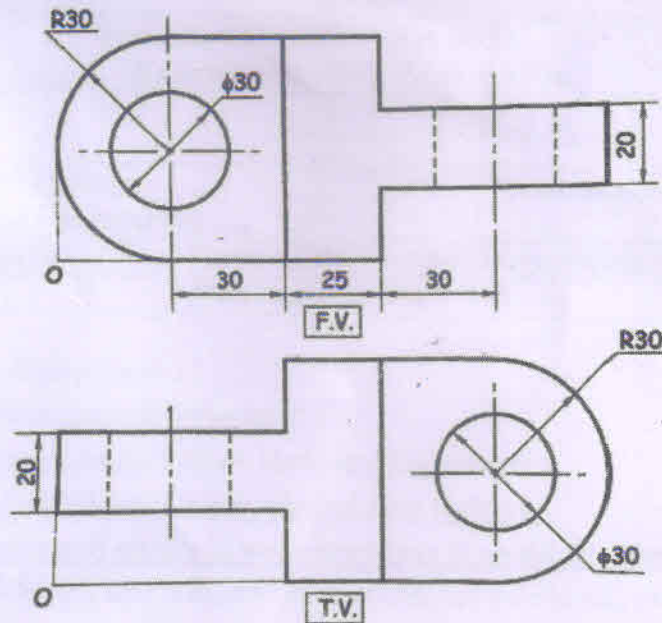


Set A

Semester: Oct 2022 – Jan 2023		
Examination: ESE Examination		
Programme code: 06	Class: FY	Sem I (SVU 2020)
Programme: B.TECH		
Name of the Constituent College: K. J. Somaiya College of Engineering		Name of the Department COMP / IT
Course Code: 116U06C105	Name of the Course: Engineering Drawing	
Duration : 3 Hour	Maximum Marks : 100	
Instructions: <ul style="list-style-type: none"> All Questions are Compulsory. Figures to the right indicate full marks. Illustrate your answers using figures, sketches, diagrams etc. Assume suitable dimensions if necessary and state it clearly. Avoid using colours and layers in your drawings to avoid problems during printing. Line type, line thickness, text size, text font, content of title block, proper dimensions etc. at appropriate place carries weightage during assessment. Arrange your drawings properly and on minimum number of pages. All the students are requested to save the drawings regularly. In case of any hardware or software problems, extra time will not be allotted to any student for unsaved work. <p>Any kind of electronic gadgets capable of memory storage such as pen drive, mobile etc. are not permitted.</p>		

Question No.		Max Marks
Q1 (A)	<p>Solve any TWO of the following</p> <p>a) Draw the projections of 80 mm long line AB which measures 50 mm in its plan and inclined at 30° to VP. The point A is 10 mm above HP and 20 mm in front of VP. Find its inclination with HP. Point B is in first quadrant.</p> <p>b) End A of line AB is in second quadrant, and is 40 mm and 15 mm from HP and VP respectively. The line is inclined at 40° to both reference planes. Draw its projection when end B is in third quadrant and 45mm from HP. Find its true length and distance of end B from VP.</p> <p>c) A rectangular plane ABCD with length 50 mm and breadth 30 mm has its surface inclined to the V.P. at an angle 45° and perpendicular to H.P. such that the longer side BC is 10 mm above the H.P. and shorter side AB 20 mm in front of V.P. Draw the projections.</p>	20
Q2	<p>Figure shows pictorial view of an object. Draw using first angle method of projections,</p> <ol style="list-style-type: none"> Sectional Front view along A-B; Top View; Right Hand Side View <p>Note: Insert 10 to 12 important dimensions</p>	20

c) Figure shows F.V. and T.V. of an object. Draw isometric view about an origin 'O'.



Q4.

A right regular pentagonal pyramid of 50 mm base sides and 90 mm height is lying on one of its triangular surface on HP such that top view of axis is inclined at an angle of 45° to VP. Draw projections of pyramid.

OR

A cone of 60 mm diameter and axis 66 mm long is lying on one of its generators in VP with FV of an axis is inclined at 50° with HP. Draw projections considering apex is nearer to the observer.

20

Q5

A cylinder, 30 mm diameter and 50 mm long stand vertically on its circular base. It is cut by an AIP inclined at 45° to the HP which bisects an axis of a cylinder. Draw the FV, sectional TV and true shape of section. Draw the development of lateral surface of truncated cylinder.

OR

A hexagonal prism with 28 mm sides of base and 65 mm axis height is resting its base on HP and has one side of base perpendicular to VP. The section plane inclined at 55° to HP cuts the prism 20 mm above the base. Draw the FV sectional TV and true shape of section. Also draw the development of lateral surface of the retained prism.

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Set B

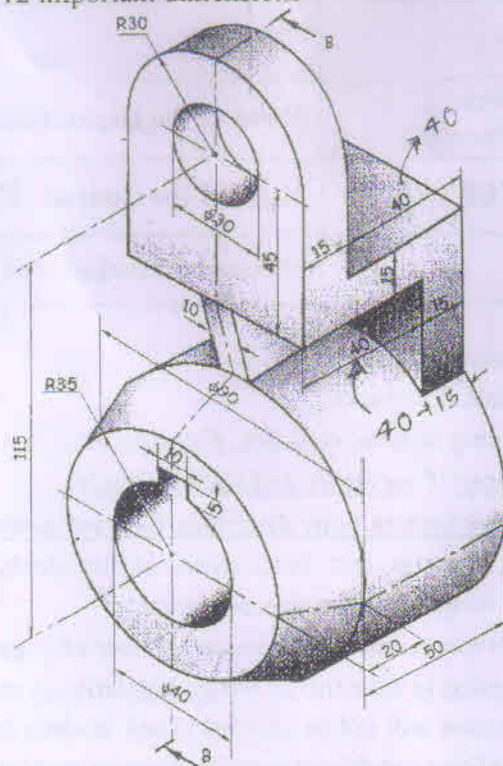
Question No.		Max Marks
Q1	<p>Solve any <u>TWO</u> of the following</p> <p>(a) The projectors of the ends of a line AB are 50 mm apart. The end A is 20 mm above the H.P and 30mm in front of V.P. The end B is 10 mm below H.P. and 40 mm behind the V.P. Draw its projections; determine the true length and its inclination with the two planes.</p> <p>(b) A line AB, 90mm long, is inclined at 45° to the H.P. and its top view makes an angle of 60° with the V.P. The end A is in the H.P. and 12 mm in front of VP. Draw its projections and find its true inclination with the V.P. Assume end B in 3rd quadrant.</p> <p>(c) A pentagonal plane lamina of sides 30 mm is resting on the HP on one of its corners so that the surface makes an angle of 60° with the HP. Draw its projections.</p>	<p>10</p> <p>10</p> <p>10</p>

Q2

Figure shows pictorial view of an object. Draw using first angle method of projections, Draw

- Sectional Front view along B-B;
- Top View;
- Left hand Side View.

Note: Insert 10 to 12 important dimensions



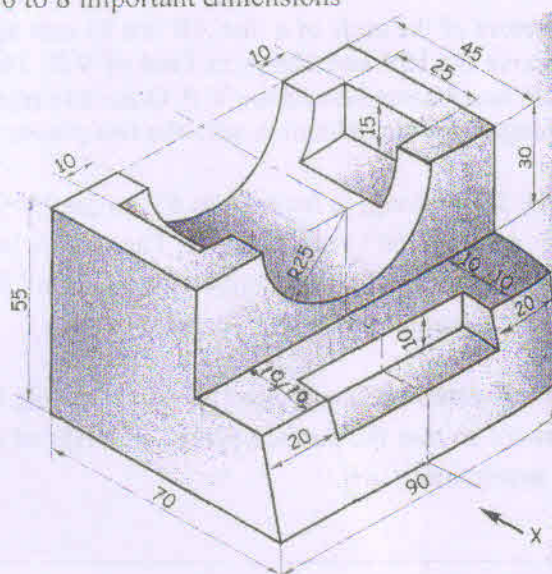
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Q3

Solve any **TWO** of the following

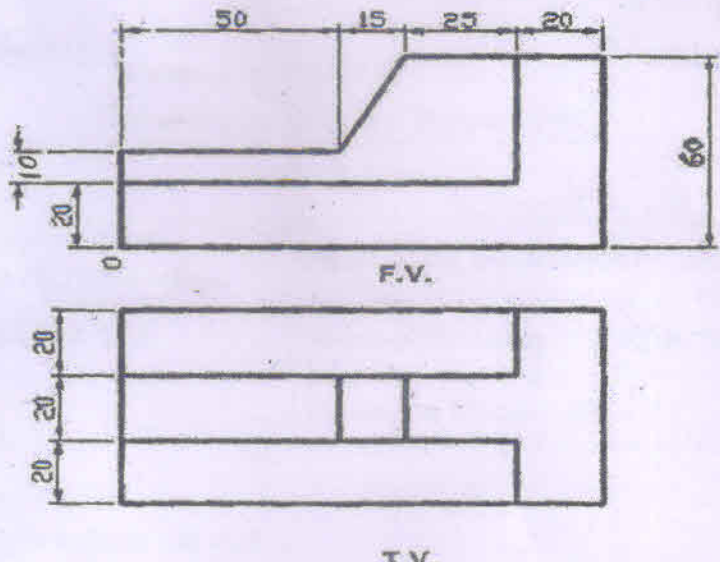
- A thin square plate ABCD of 45 mm edges is having its corner A on HP with the diagonal AC inclined at 35° to the HP. Draw the projections of plate ABCD.
- Figure shows pictorial view of an object.
Draw using first angle method of projections
 - Front view along X
 - Top View

Note: Insert 6 to 8 important dimensions



10

10

	<p>(c) Figure shows F.V. and T.V. of an object. Draw isometric view about an origin 'O'.</p>  <p style="text-align: center;">F.V.</p> <p style="text-align: center;">T.V.</p>	10
Q4	<p>A square pyramid of 40 mm base sides and height 70 mm is lying on one of its slant on the HP, and top view of the slant edge is inclined at an angle of 45° to the VP. Draw the projections of the pyramid when the apex is nearer to VP.</p> <p>OR</p> <p>A pentagonal prism of base side 30 mm and height 60 mm rests on one of its base edge on the HP and the same base edge is inclined at 30° to the VP. Its axis is inclined at 45° to the HP. Draw its projections.</p>	20 20
Q5	<p>A hexagonal pyramid 40 mm edge of base, 70 mm axis length rests vertically on its base on HP with two base edges perpendicular to VP. It is cut by a section plane perpendicular to VP and inclined at 60° to HP, such that it passes through a point on axis 40 mm above the base.</p> <p>Draw - Front View, Sectional Top View and True Shape of the section. Also draw development of the lateral surface of major part of the pyramid.</p> <p>OR</p> <p>A cone base diameter 50 mm and axis 60 mm is resting on its base on the HP. It is cut by a section plane inclined at 60° to VP and passes through a point 15 mm away from the axis.</p> <p>Draw - Sectional Front View, Top View and True Shape of the section. Also draw development of the lateral surface of major portion of the cone.</p>	20 20

15-2-2023(M)


SOMAIYA
 VIDYAVIHAR UNIVERSITY

Set C

Semester: Oct 2022 – Jan 2023
Examination: ESE Examination

Programme Code: 06 Programme: B.TECH	Class: FY	Sem I (SVU 2020)
Name of the Constituent College: K. J. Somaiya College of Engineering	Name of the Department : COMP / IT	
Course Code: 116U06C105	Name of the Course: Engineering Drawing	
Duration : 3 Hour	Maximum Marks : 100	

Instructions:

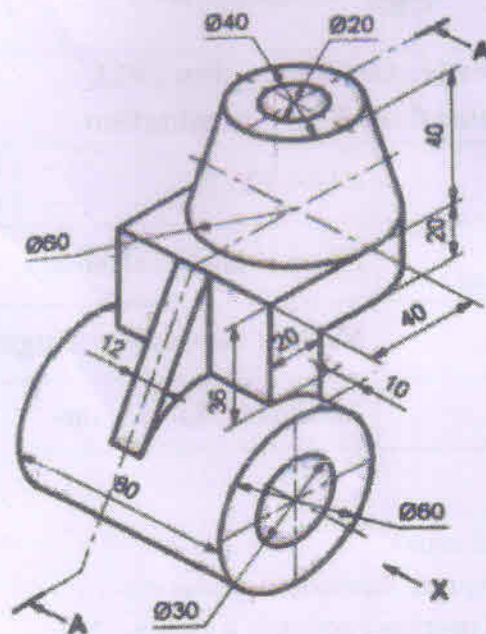
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- All the students are requested to save the drawings regularly. In case of any hardware or software problems, extra time will not be allotted to any student for unsaved work.
- Any kind of electronic gadgets capable of memory storage such as pen drive, mobile etc. are not permitted.

Question No.		Max Marks
Q1	Solve any TWO of the following	
	(a) The end A of line AB is 10 mm above the HP and 30 mm in front of the VP. The end B is 50 mm below the HP and 15 mm behind the VP. The length of the line is 80 mm. Draw the projections of the plane and find the inclination with the reference planes.	10
	(b) A line PQ, 100 mm long is inclined at 40° to the HP and 30° to the VP. Its end P is 30 mm above the HP and 40 mm in front of the VP. The end Q is in the third quadrant. Draw the projection of the line.	10
	(c) A pentagonal plane of lamina of sides 30 mm is resting on the H.P. on one of its corner so that the surface makes an angle of 60° with the H.P. Draw the front view and top view of a pentagon.	10

Q2

Figure shows pictorial view of an object.

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Draw using first angle method of projections,

- Sectional Front view along X along A-A;
- Top View;
- L.H.S.V.

Note: Insert 10 to 12 important dimensions

Q. 3

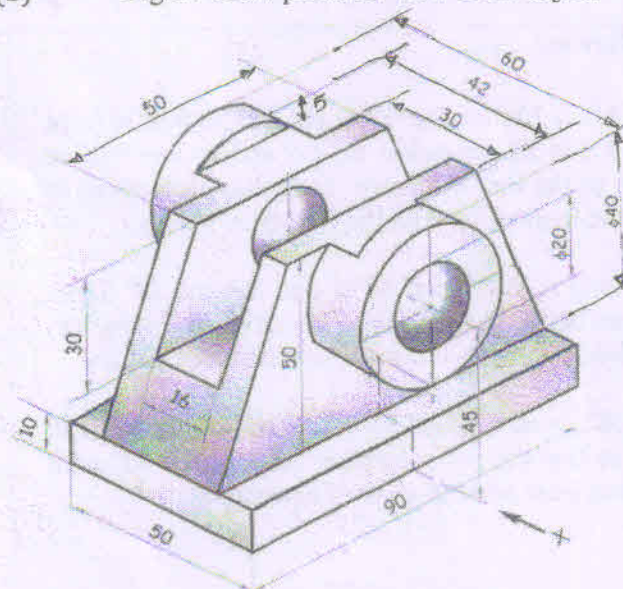
Solve any **TWO** of the following

- An isosceles triangular plate of 50 mm base and 75 mm altitude appears as an equilateral triangle of 50 mm in top view. Draw the projections of a plate if its 50 mm long edge is on the H.P. What is the inclination of the plate with the H.P.?

10

- Figure show pictorial view of an object

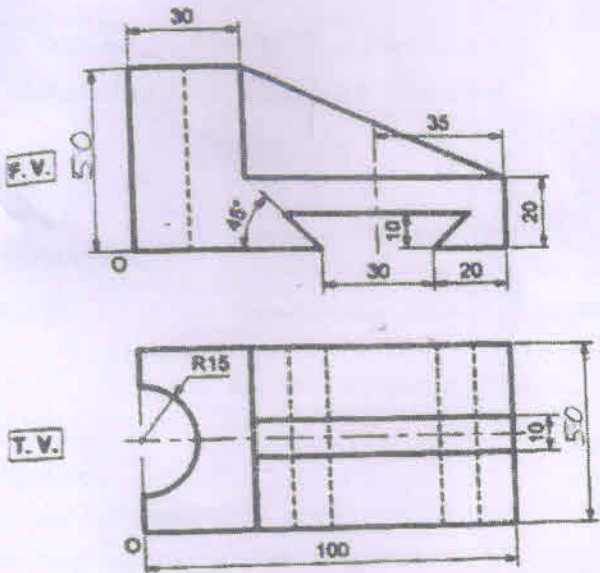
10



Draw using first angle method of projections

- Front view along X
- Top View

Note: Insert 6 to 8 important dimensions

	<p>(c) Figure shows F.V. and T.V. of an object. Draw isometric view about an origin 'O'.</p> 	10
Q. 4	<p>A right regular pentagonal pyramid of 50 mm base sides and height 90 mm is lying on one of its triangular surface on the H.P., such that the top view of the axis is inclined at an angle of 45° to the V.P. Draw its front view and top view when apex of the pyramid is nearer to V.P.</p> <p><u>OR</u></p> <p>Draw the projections of the cone, base 50mm diameter and axis 75mm long, having one of its generators in the V.P. and inclined at 30° to HP. The apex is in H.P.</p>	20 20
Q. 5	<p>A square pyramid, base of 30 mm and axis 40 mm long stands vertically on the H.P. with the edges of the base equally inclined to the V.P. It is cut by the section plane perpendicular to the V.P., inclined at 45 degree to the HP and passing through the point on the axis 25mm from the apex. Draw FV, sectional TV and true shape of section. Also draw DLS assuming apex part to be removed.</p> <p><u>OR</u></p> <p>A right circular cone of base diameter 40 mm, axis height 50 mm has its base in the H.P. It is cut by auxiliary inclined plane which makes an angle 45 degree to the HP and passes through the point on the axis 20 mm below the apex. Draw FV, sectional TV and true shape of section. Develop the lateral surface of truncated cone.</p>	20 20