13-07-2023 (FN)

Q.P. Code: 1824402

SET - 2

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

B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Effective Technical Communication (CE)

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

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

			Marks	CO	BL
		UNIT - I			
1.	(a)	What are the characteristics of Technical communication? Expand.	7M	CO1	L1
	(b)	What are the types of Technical communication? Describe.	7M	CO1	L2
		(OR)			
2.	(a)	What are the barriers of effective communication?	7M	CO1	L1
	(b)	Describe the objectives and the importance of Technical communication.	7M	CO1	L2
		UNIT – II			
3.	(a)	Define Writing drafts, revising, Collaborative writing and creating indexes.	7M	CO2	L1
	(b)	Discuss the factors of advanced technical communication.	7M	CO2	L2
		(OR)			
4.	(a)	What are the editing strategies to achieve appropriate technical style?	7M	CO2	L1
	(b)	What is Technical writing Process?	7M	CO2	L1
		UNIT – III			
5.	(a)	**"Self- awareness is a key to self- mastery"** relate this quote to your Self-Development	7M	CO3	L2
	(b)	What is Self-esteem? Explain.	7M	CO3	L1
		(OR)			
6.	(a)	What are the elements of creativity?	7M	CO3	L1
	(b)	Explain about problem solving skill and time-management skill.	7M	CO3	L2
		UNIT – IV			
	(a)	Discuss the do's and don'ts of Group discussion.	7M	CO4	L2
	(b)	How will you project a positive image in an interview?	7M	CO4	L1
		(OR)			
8.	(a)	Write about structure and types of report writing.	7M	CO4	L1
	(b)	You are a sales representative for your company. Write a letter to ABC Enterprises, introducing one of your new products or services.	7M	CO4	L2
		UNIT-V			
9.	(a)	Describe Etiquettes in social and office settings.	7M	CO5	L2
	(b)	How do you solve a complex problem in your work place?	7M	CO5	L1
		(OR)			
10.	(a)	What is the importance of Telephone Etiquettes?	7M	CO5	L1
	(b)	What is the Role and responsibility of an engineer in society?	7M	CO5	L2

Q.P. Code: 1801404 | SET - 2

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

B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Fluid Mechanics (CE)

Time: 3 Hours | Max. Marks : 70

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

			M	CO	BL
		UNIT - I			
1.	(a)	Define Newton's law of viscosity. Derive an expression for dynamic viscosity with neat sketch.	7M	CO1	L3
	(b)	A plate having an area of 200mm x 300 mm is sliding down the inclined plane at 300 to the horizontal with velocity of 0.36 m/s. There is a cushion of fluid 1.8 mm thick between the plate and the plane. Find the viscosity of the fluid, if the weight of plate is 280 N.	7M	CO1	L3
		(OR)			
2.	(a)	Explain how cavitation occurs, effects of cavitation and control measures.	7M	CO1	L2
	(b)	Explain Capillarity. Show that for a glass tube of small diameter 'd' opened at both ends, held partially immersed in a liquid of surface tension ' σ' and specific weight 'w', the capillary rise 'h' is given by the expression $\frac{4\sigma\cos\theta}{wXd}$ in which the θ is the angle of contact.	7M	CO1	L3
		UNIT – II			
3.	(a)	What do you mean by single column manometer? Explain with a neat sketch how it is used for pressure measurement.	7M	CO2	L2
	(b)	State and prove Pascal's law.	7M	CO2	L3
		(OR)			
4.	(a)	A gauge on the suction side of a pump shows a negative pressure of 0.285 bar. Express this pressure in terms of (i) N/m2 absolute (ii) m of water gauge (iii) m of oil (sp. gr. 0.85) absolute and (iv) cm of mercury gauge. Take atmospheric pressure as 76 cm of mercury and specific gravity of mercury as 13.6.	7M	CO2	L3
	(b)	Explain briefly the working principle of Bourdon Pressure Gauge with a neat sketch.	7M	CO2	L2
		UNIT – III			
5.	(a)	Define path line, streak line, and stream line with neat sketches. For what type of flow path line, streak line, and stream lines are identical.	7M	CO3	L2
	(b)	If a fluid flow is given by $V = 2x^3i + 3x^2yj$, then determine whether (i) the flow is steady or unsteady (ii) flow is two-dimensional or three-dimensional?	7M	CO3	L3
		(OR)			
6.	(a)	Differentiate between the following (i) Rotational and irrotational flow (ii) stream function and velocity potential function (iii) ideal fluid flow and real flow	7M	CO3	L2
	(b)	Derive an expression of continuity equation for three dimensional flow in Cartesian coordinates	7M	CO3	L3
		UNIT – IV			
7.	(a)	What is a pitot tube and how will you determine the velocity at any point with the help of it? Also state how it is different than pitot-static tube?	7M	CO4	L4
	(b)	State the Momentum equation and explain the force exerted by flowing fluid on a pipe bend.	7M	CO4	L3
		(OR)			

8.	(a)	A horizontal venturimeter with inlet diameter 200 mm and throat diameter 100mm is used to measure the discharge. If the pressure at the inlet and vacuum pressure at the throat is 180 kPa and 0.35 ml lg, respectively and the coefficient of meter is 0.98, then determine its discharge.	7M	CO4	L4
	(b)	What is venturimeter? Derive the equation for discharge flow through venture meter.	7M	CO4	L3
		UNIT-V			
9.	(a)	The drag force exerted by a flowing fluid on a solid body depends upon the length of the body L, velocity of flow V, density of fluid ρ, and viscosity μ. Find an expression for drag force using Buckingham' theorem	7M	CO5	L4
	(b)	What is meant by geometric, kinematic and dynamic similarities? Are these similarities truly attainable? If not why?	7M	CO5	L3
		(OR)			
10.	(a)	What do you mean by repeating variables? How are the repeating variables selected for dimensional analysis	7M	CO5	L4
	(b)	Define the following non-dimensional numbers along with their significance (i) Mach Number, (ii) Weber Number and (iii) Euler Number	7M	CO5	L2

Q.P. Code: 1801405

SET - 2

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

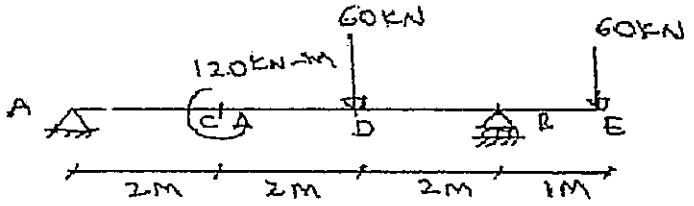
B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Solid Mechanics – I (CE)

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

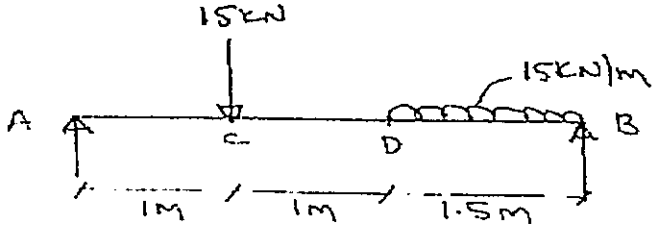
Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

			M	CO	BL
		UNIT - I			
1.	(a)	Define the four elastic constants?	7M	CO1	L1
	(b)	A steel tube 45 mm external diameter and 3 mm thick encloses centrally a solid copper bar 30 mm diameter. The bar and the tube are rigidly connected together at their ends at a temperature of 30°C. Find the stresses developed in each material when heated to 180°C Take Es = 200 GPa, α_s = 10.8 x 10^{-6}/°C; Ec = 110 GPa, α_c = 17 x 10^{-6} /°C	7M	CO1	L5
		(OR)			
2.	(a)	Derive an expression for elongation of tapering circular bar due to an axial load P, using standard notations?	7M	CO1	L5
	(b)	The diameter of a specimen is found to reduce by 0.004mm, when it is subjected to a tensile force of 19KN. Initial diameter of the specimen is 20mm. Taking modulus of rigidity for the material of specimen as 0.4×10^5N/mm^2, determine the values of young's modulus and Poisson's ratio?	7M	CO1	L5
		UNIT – II			
3.	(a)	Show that max BM for a simply supported beam of length *l* carrying UDL of intensity W/unit length is $wl^2/8$?	7M	CO2	L1
	(b)	Draw SFD and BMD for the load diagram, shown in Fig. Mark the values at salient points.	7M	CO2	L6



(OR)

4.	(a)	Derive the relationship between load intensity, shear force and bending moment.	7M	CO2	L5
	(b)	A simply supported beam is subject to a point load of 15 kN together with udl of 15 kN/m applied as shown in Fig. Draw SFD and BMD. Find also point of zero shear and its corresponding BM.	7M	CO2	L5



UNIT – III

5.	(a)	Define the following:- (i) Section modulus (ii) Modulus of Rupture (iii) Moment of resistance	7M	CO3	L1
	(b)	A beam is simply supported and carries a uniformly distributed load of 40KN/m run over the whole span. The section of the beam is rectangular having depth as 500mm.If the maximum stress in the material of the beam is 120N/mm^{2}and moment of inertia of the section is 7×10^8mm^4, find the span of the beam.	7M	CO3	L5

(OR)

6.	(a)	Derive the expression the shear stress for a solid circular section	7M	CO3	L5
	(b)	A T-section beam has a top flange of (120mm x 20mm) and the web of (20mm x 100mm). The overall depth is 120mm. It is subjected to a shear force of 60kN. Draw the shear stress distribution diagram.	7M	CO3	L5

UNIT – IV

7.	(a)	Determine slope and deflection for a simply supported beam with an Universally varying load	7M	CO4	L5
	(b)	A beam 6 m long, simply supported at its ends, is carrying a point load of 50 KN at its centre. The moment of inertia of the beam is 78 x 10^6 mm^4. If E for the material of the beam = 2.1 X 10^5 N/mm^2. Calculate deflection at the centre of the beam and slope at the supports.	7M	CO4	L5

(OR)

8.	(a)	Determine slope and deflection for a simply supported beam with an eccentric point load	7M	CO4	L5
	(b)	A beam 3 m long, simply supported at its ends, is carrying a point load W at the centre. If the slope at the ends of the beam should not exceed 1° , find the deflection at the centre of the beam	7M	CO4	L5

UNIT-V

9.	(a)	State the assumption made in the theory of pure torsion.	7M	CO5	L1
	(b)	Determine the dimensions of hollow circular shaft with the diameter ratio of 3:4 which is to transmit 60kW at 200 Rpm. The maximum shear stress in shaft is limited to 70Mpa and the angle of twist is 3.8 degrees in a length of 4m, take G=80Gpa	7M	CO5	L5

(OR)

10.	(a)	Explain briefly the different Types of Springs	7M	CO5	L2
	(b)	A closely coiled helical spring of round steel wire 10 mm in diameter having 10 complete turns with a mean diameter of 12 cm is subjected to an axial load of 200 N. Determine, (i) The deflection of the spring (ii) Maximum shear stress in the wire	7M	CO5	L5

11-07-2023

Q.P. Code: 1821401 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023
SUB: Mathematics-III (EEE)

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

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

			Marks	CO	BL
		UNIT - I			
1.	(a)	Find the value of $J_{\frac{1}{2}}(x)$ and $J_{-\frac{1}{2}}(x)$	7M	CO1	L1
	(b)	Show that $J_0(x)=\frac{1}{\pi}\int_0^{\pi}\cos(x\cos\phi)d\phi$	7M	CO1	L2
		(OR)			
	(a)	Show that $p_0(x)=1, p_1(x)=x, p_2(x)=\frac{3x^2-1}{2}$	7M	CO1	L2
	(b)	Translate x^2-3x+4 in terms of Legendre polynomials.	7M	CO1	L2
		UNIT – II			
3.	(a)	Find all values of k, such that $f(z)=e^x(\cos ky+i\sin ky)$ is analytic	7M	CO2	L1
	(b)	Prove that $\left(\frac{\partial^2}{\partial x^2}+\frac{\partial^2}{\partial y^2}\right)\left\|\text{Re}\,alf(z)\right\|^2=2\left\|f'(z)\right\|^2$ where $w=f(z)$ is analytic	7M	CO2	L2
		(OR)			
4.		Find K such that $f(x,y)=x^3+3Kxy^2$ may be harmonic and find its conjugate.	14M	CO2	L1
		UNIT – III			
5.	(a)	Find the image of the circle $\left\|z-2i\right\|=2$ under the transformation w = 1/z.	7M	CO3	L1
	(b)	Find the fixed points of the transformation $w=\frac{2i-6z}{iz-3}$	7M	CO3	L1
		(OR)			
6.		Find the bilinear transformation which maps the points $z=1,-i,-1$ into the points $w=i,0,-i$	14M	CO3	L1
		UNIT – IV			
7.		State and prove Cauchy's integral formula .	14M	CO4	L3
		(OR)			
8.	(a)	Evaluate $\int_c \frac{\log z\,dz}{(z-1)^3}$ where c : $\|z-1\|=\frac{1}{2}$. Cauchy's integral formula	7M	CO4	L5
	(b)	Find $\int_0^{1+i}(x-y^2+ix^3)dz$ along the real axis from z=0 to z=1+i	7M	CO4	L1
		UNIT-V			
9.	(a)	Find the residues of $f(z)=\frac{z+1}{z(z-2)}$	7M	CO5	L1
	(b)	Find $\oint_c \frac{e^{2z}}{(z-1)(z-2)}dz$ where C is the circle $\|z\|=3$ using residue theorem.	7M	CO5	L1
		(OR)			
10.		Find by contour integration $\int_0^{\infty}\frac{dx}{x^2+1}$	14M	CO5	L1

Q.P. Code: 1814402

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023
SUB: Digital System Design (EEE)

Time: 3 Hours Max. Marks: 70

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

			Marks	CO	BL
		UNIT - I			
1.	(a)	Make use of complements to perform subtraction using 7's complement for the given Base-7 numbers $(565)_7$-$(666)_7$.	7M	CO1	L3
	(b)	Explain about different Error Correction and Detection codes.	7M	CO1	L2
		(OR)			
2.	(a)	Build the Procedure for finding 2's complement subtraction of any two binary numbers.	7M	CO1	L3
	(b)	Dissect various number systems and codes and their conversion with examples for each.	7M	CO1	L4
		UNIT – II			
3.	(a)	Summarize the concept of positive logic and negative logic. Also draw the truth tables for positive logic AND gate and negative logic OR gate.	7M	CO2	L2
	(b)	Realize logic gates AND, OR, NOR using NAND gate.	7M	CO2	L3
		(OR)			
4.	(a)	Draw the multiple level NOR circuit for the following expression: $F= A(B + C + D) + BCD$	7M	CO2	L3
	(b)	Simplify the following Boolean function together with don't care conditions d, and implement it using NAND gates. $F(A,B,C,D) = \sum m(0,6,8,13,14) + \sum d(2,4,10)$	7M	CO2	L3
		UNIT – III			
5.	(a)	Design half adder using 2x4 Decoder	7M	CO3	L4
	(b)	Design a 4 bit adder-subtractor and explain its operation.	7M	CO3	L4
		(OR)			
6.	(a)	Explain the working and functions of decoders and encoders. Construct 2/4 line decoder with logic gates with enable input.	7M	CO3	L2
	(b)	Define decoder. Construct 3x8 decoder using logic gates.	7M	CO3	L4
		UNIT – IV			
7.	(a)	Explain the operation of negative edge triggered J-K -flip-flop with active low preset and clear using NAND gates. Give its truth table.	7M	CO4	L4
	(b)	Explain synchronous and ripple counters. Compare their merits and demerits.	7M	CO4	L2
		(OR)			
8.	(a)	Give the block diagram of synchronous and asynchronous sequential circuits and list out the merits and demerits.	7M	CO4	L2
	(b)	Draw the block diagram and timing diagram of a shift register that shows the serial transfer of information from register A to register B and explain	7M	CO4	L3
		UNIT-V			
9.	(a)	Draw a PLA circuit to implement the functions. $F_1=A^1B+AC^1+A^1BC^1$ $F_2=(AC+AB+BC)^1$	7M	CO5	L3
	(b)	Given 32×8 ROM with enable input, Show the external connections necessary to construct a 128×8 ROM with 4 chips and a decoder.	7M	CO5	L4
		(OR)			
10.	(a)	Discuss about Read and Write operation in Random access memory.	7M	CO5	L4
	(b)	A combinational circuit is defined by the functions: $F_1=\sum m(3,5,7)$ $F_2=\sum m(4,5,7)$ Implement the circuit with a PLA having 3 inputs, 3 product terms and two outputs.	7M	CO5	L3

Q.P. Code: 1802404

SET - 2

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

B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Control Systems (EEE, ECE)

Time: 3 Hours

Max. Marks: 70

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

			M	CO	BL
		UNIT - I			
1.	(a)	Write the merits and demerits of Open Loop and closed loop control systems	7M	CO1	L1
	(b)	Explain effects of feedback on system performance?	7M	CO1	L2
		(OR)			
2.		Calculate the differential equations governing the mechanical system shown in Fig.1. and determine the transfer function.	14M	CO1	L3

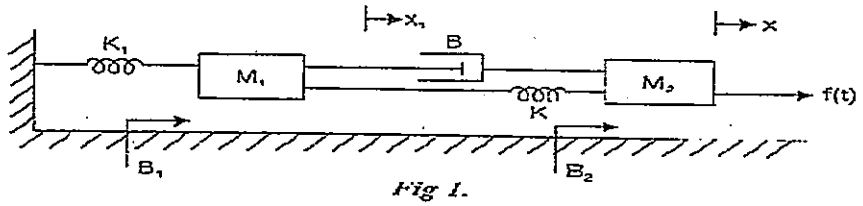


Fig 1.

		UNIT – II			
3.	(a)	Explain Time domain specifications for transient response?	7M	CO2	L3
	(b)	Explain static error coefficient of type 0,1, 2 systems	7M	CO2	L3
		(OR)			
4.		For a Unity Feedback Control system the open loop transfer function $G(s)=\frac{10(S+2)}{S^2(S+1)}$. Calculate the (i) Static Error Constants (ii) Steady State Errors for an input is $\frac{3}{S}-\frac{2}{S^2}+\frac{1}{3S^3}$	14M	CO2	L3
		UNIT – III			
5.	(a)	What are the difficulties in the formulation of the Routh Array table? Explain how they can be overcome.	7M	CO3	L1
	(b)	Determine the stability of the system having characteristic equation given below: $S^4+4s^3+6s+4=0$	7M	CO3	L2
		(OR)			
6.	(a)	The open loop transfer function for a unity feedback system is given by $G(S)=\frac{K}{S(1+T_1S)(1+T_2S)}$. Find the necessary conditions for the system to be stable using Routh's criterion of stability	7M	CO3	L2
	(b)	A unity feedback control system has an open loop transfer function $G(s)=\frac{K}{S(S^2+4S+13)}$. Sketch the Root Locus	7M	CO3	L3
		UNIT – IV			
7.		Explain the Procedure for the Construction of Nyquist Plot with an example	7M	CO4	L2
		(OR)			
8.		For the following transfer function draw the bode plot and obtain gain cross over frequency. $G(s)=\frac{20}{S(1+3S)(1+4S)}$	14M	CO4	L3
		UNIT-V			
9.		Draw and Explain Lead Compensator with a neat sketch. Derive the Transfer function.	14M	CO5	L2
		(OR)			
10.		Draw and Explain Lag-Lead Compensator with a neat sketch. Derive the Transfer function.	14M	CO5	L2

Q.P. Code: 1802406

SET - 2

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

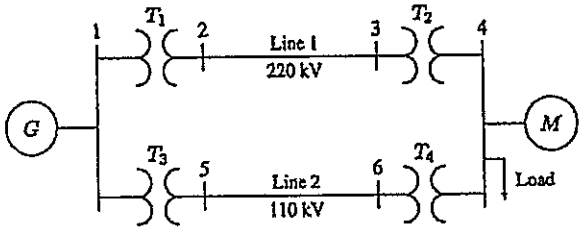
B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Power Systems – II (EEE)

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

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

			M	CO	BL
		UNIT - I			
1.	(a)	Using rigorous method, deduce the expression for sending end voltage and current of a long transmission line when the receiving end parameters are taken as reference.	8M	CO1	L3
	(b)	An overhead 3-phase transmission line delivers 5000kw at 22kV at 0.8 p.f lagging. The resistance and reactance of each conductor is 4Ω and 6Ω respectively. Determine: (i) sending end voltage (ii) percentage regulation (iii) transmission efficiency.	6M	CO1	L4
		(OR)			
2.	(a)	A 3-phase, 50 Hz transmission line 100 km long delivers 20 MW at 0·9 p.f. Lagging and at 110 kV. The resistance and reactance of the line per phase per km are 0·2 Ω and 0·4Ω respectively, while capacitance admittance is $2{\cdot}5 \times 10^{-6}$ siemen/km/phase. Calculate: (i) the current and voltage at the sending end (ii) efficiency of transmission. Use nominal T method.	7M	CO1	L4
	(b)	Develop the expressions for the following in a medium transmission line using Nominal π network. (i) Sending end voltage and current (ii) Sending end power factor (iii) Voltage regulation (iv) Transmission efficiency.	7M	CO1	L3
		UNIT – II			
3.	(a)	Illustrate the advantages of per unit system?	6M	CO2	L3
	(b)	The one-line diagram of a three-phase power system is shown in figure. Select a common base of 100MVA and 22KV on the generator side. Sketch an impedance diagram with all impedances including the load impedance marked in per-unit. The manufacturer's data for each device is given as follow.G: 90 MVA,22KV,X=18% T1:50 MVA, 22/220KV X=10% T2:40 MVA 220/11KV,X=6% T3:40 MVA 22/110KV X=6.4% T4:40 MVA ,110/11KV,X=8.0% M:66.5MVA,10.45KV, X=18.5% The three-phase load at bus 4 absorbs 57MVA, 0.6 p. f lagging at 10. 45KV.Line 1 and line 2 have reactances of 48.4 and 65.43Ω, respectively.	7M	CO2	L3



(OR)

4.	(a)	Describe the procedure of obtaining impedance diagram from single line diagram.	7M	CO2	L3
	(b)	Show that: $$Z_{p.u(new)} = Z_{p.u(old)} \times \frac{MVA_{BASE(new)}}{MVA_{BASE(old)}} \times \frac{(KV)^2_{BASE(old)}}{(KV)^2_{BASE(new)}}$$	7M	CO2	L3

UNIT – III

5.	(a)	Illustrate the internal voltages of loaded Synchronous machine under transient conditions.	7M	CO3	L3
	(b)	A 3-phase, 20 MVA, 10 kV alternator has internal reactance of 5% and negligible resistance. Find the external reactance per phase to be connected in series with the alternator so that steady current on short-circuit does not exceed 8 times the full load current.	7M	CO3	L3

(OR)

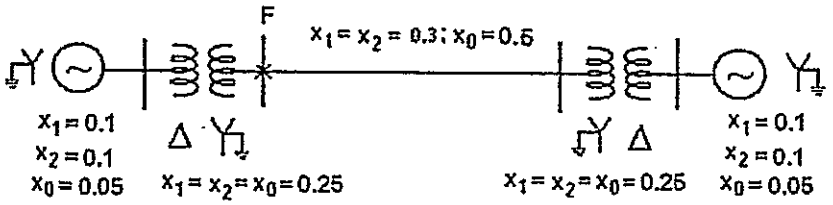
6.	(a)	Illustrate the effects of short-circuit fault on the power system.	7M	CO3	L3
	(b)	What do you understand by percentage reactance? Why do we prefer to express the reactance's of various elements in percentage values for short-circuit calculations?	7M	CO3	L2

UNIT – IV

7.	(a)	Deduce the expression for power in terms of symmetrical components.	7M	CO4	L4
	(b)	Solve the symmetrical components of currents in a three-phase system, the original phasors of which are I_a=12-j6 I_b=12+j12, I_c=-10+j5 only for phase a.	7M	CO4	L3

(OR)

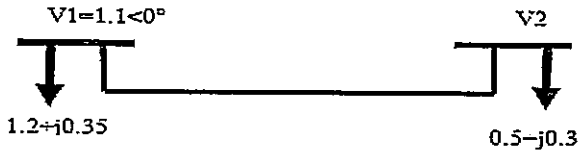
8.	(a)	For the system shown in Figure A LG fault occurs at point F. Find fault current.	7M	CO4	L3



	(b)	Deduce the expression for fault current when a LLG fault occurs at the unloaded generator terminals. Also draw the sequence network diagram.	7M	CO4	L4

UNIT-V

9.	(a)	A two bus system is shown in below figure. Calculate the bus 2 voltage at the end of first iteration by G-S method. The elements of bus admittance matrix are $Y_{11}= Y_{22}= 1.5 \angle -86°$ P.U and $Y_{21}=Y_{12}= 1.8\angle 110°$ P.U.	7M	CO5	L4

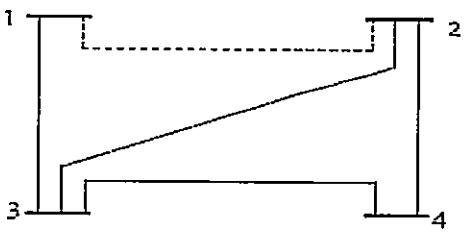


	(b)	Illustrate Gauss Seidel method of load flow solution and derive the necessary equations	7M	CO5	L3

(OR)

10.	(a)	Deduce the expressions for elements of Jacobian matrix in Newton Raphson method of solving load flow equations.	7M	CO5	L4
	(b)	Figure below shows the single line diagram of a simple four bus system. Table gives the line impedances identified by the buses on which these terminate. The shunt admittance at all the buses is assumed to be negligible. (i) Find Y BUS assuming that the line shown dotted is not connected.	7M	CO5	L3

Line Bus to bus	R (p.u.)	X (p.u.)
1 – 2	0.05	0.15
1 – 3	0.10	0.30
2 – 3	0.15	0.45
2 – 4	0.10	0.30
3 - 4	0.05	0.15



(ii) What modification needs to be carried out in Y BUS if the line shown dotted is connected?

Q.P. Code: 1803401

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023
SUB: Applied Thermodynamics (ME)

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

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

			Marks	CO	BL
		UNIT - I			
1.		Define the terms Brake Power, Indicated Power, mechanical efficiency, Indicated thermal efficiency, brake thermal efficiency, brake specific fuel consumption, relative efficiency.	14M	CO1	L 1
		(OR)			
2.	(a)	Explain battery ignition system and write the advantages and disadvantages?	7M	CO1	L 2
	(b)	Compare 2 stoke engine and 4 stroke engines.	7M	CO1	L 1
		UNIT – II			
3.		Derive the expression for volumetric efficiency of multi-stage reciprocating air compressor.	14M	CO2	L 2
		(OR)			
4.		List the various types of positive rotary type compressors. Explain with neat sketches?	14M	CO2	L 1
		UNIT – III			
5.		Define boiler, classify and explain any one method and write advantages and disadvantages.	14M	CO3	L 1
		(OR)			
6.		Explain the construction and working of a Babcock-Wilcox Boiler with help of a neat diagram?	14M	CO3	L 2
		UNIT – IV			
7.	(a)	Define nozzle and write it's uses.	7M	CO4	L 1
	(b)	Differentiate between surface condenser and jet condenser.	7M	CO4	L 1
		(OR)			
8.		A convergent-divergent nozzle is required to discharge steam at a rate of 2 kg/sec. The nozzle is supplied with steam at a pressure of 7 bar and temperature 180°C. The back pressure is 1 bar. The frictional resistance between throat and exit is 63 kJ/kg. Taking approach velocity 75 m/s and throat pressure is 4 bar. Estimate, (i) The suitable area for the throat exit (ii) Overall efficiency of nozzle based on enthalpy drop between the actual inlet pressure, temperature and exit pressure	14M	CO4	L 3
		UNIT-V			
9.		Derive the expression for maximum efficiency of Parson's reaction turbine.	14M	CO5	L 2
		(OR)			
10.		Obtain the expression for maximum efficiency of an impulse turbine and explain the pressures compounding of impulse turbine.	14M	CO5	L 2

Q.P. Code: 1803402

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023
SUB: Fluid Mechanics (ME)

Time: 3 Hours

Max. Marks: 70

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

			Marks	CO	BL
		UNIT - I			
1.	(a)	When the pressure of a liquid increased from 2 MPa to 5 MPa and the corresponding decrease in volume is found to be 0.1 percent. Determine bulk modulus of elasticity of the fluid.	7M	CO1	L1
	(b)	A hot plate of area $0.125m^2$ is pulled at 0.25m/s with respect to another stationery parallel plate 1mm distant from it the space between the plates contains water of viscosity 0.001 N-s/m^2, find the force necessary to maintain this velocity.	7M	CO1	L2
		(OR)			
2.	(a)	Write short notes on various types of differential U-tube manometers	7M	CO1	L1
	(b)	An inverted U-tube manometer containing an oil of specific gravity 0.9 is connected to find the difference of pressures at two points of a pipe containing water. If the manometer reading is 40cm, find the difference in the pressure.	7M	CO1	L2
		UNIT – II			
3.	(a)	What are the characteristics of Streamlines, path line and streak lines.	7M	CO2	L2
	(b)	The velocity field in a fluid flow is given by $xi- 2xyj+tzk$. Evaluate the acceleration of the fluid particle at (2,-1,1) at t=1s.	7M	CO2	L3
		(OR)			
4.	(a)	What are the assumptions made in deriving Bernoulli's equation and write any three applications of Bernoulli's Equation.	7M	CO2	L2
	(b)	A vertical pipeline 10cm diameter at the top tapers uniformly to 20cm at bottom. The length of the pipeline is 2m. If the discharge through the pipeline is $0.030m^3/s$, find the difference in pressure. Neglect friction.	7M	CO2	L3
		UNIT – III			
5.	(a)	A 50cm diameter pipe of length 500m is connected in series to a 30cm diameter pipe of length 300m to convey discharge. Assume that the friction factor remains the same for both the pipes and the minor losses are negligible. Determine a) an equivalent length of 40cm diameter pipe b) an equivalent size of pipe of 800m length.	7M	CO3	L3
	(b)	Write a brief note on various types of minor losses.	7M	CO3	L2
		(OR)			
6.	(a)	Derive the equation of discharge through an orifice meter.	7M	CO3	L3
	(b)	An oil of specific gravity 0.8 is flowing through an inclined venturi meter (20cm x 10cm) in the upward direction. The throat is 0.5m above the inlet and the pressure gauges at the entrance and the threat show pressure as $160kN/m^2$ and 85 kN/m^2 respectively. If the flow rate is $0.104m^3/s$. Find the coefficient of discharge of the given venturi meter.	7M	CO3	L2

UNIT – IV

7.	(a)	Define displacement thickness, momentum thickness and energy thickness and write the mathematical expressions for the same.	7M	CO4	L3
	(b)	Given $u/U_\infty = y/\delta$, Where u is velocity at a distance y measure vertically upward from the plate, U_∞ is free stream velocity and δ is boundary layer thickness. Find displacement thickness, momentum thickness and energy thickness.	7M	CO4	L3
		(OR)			
8.	(a)	Explain boundary layer separation while explaining about favorable and adverse pressure gradients.	7M	CO4	L3
	(b)	For the following velocity profiles over a stationary surface check whether the flow adheres or detaches from the surface. $u/U_\infty = -(3/2)*(y/\delta)+(1/2)*(y/\delta)^3+(y/\delta)^4$	7M	CO4	L3

UNIT-V

9.	(a)	An airplane weighing 33.2kN is flying at a velocity of 300km/hr. The plane has a wing surface area of $25m^2$. If the coefficient of drag is 0.025 find a) the coefficient of lift b) the drag force. The density of air is given as 1.2 kg/m3	7M	CO5	L3
	(b)	Write a short note on pressure drag and skin friction drag.	7M	CO5	L1
		(OR)			
10.	(a)	A cylinder 20 cm in diameter and 10m long is made to turn 1200 revolutions per minute with its axis perpendicular in a stream of air having uniform velocity of 20 m/s. Find the circulation, the lift force experienced by the cylinder and the position of stagnation point. The density of air 1.22 kg/m^3.	7M	CO5	L3
	(b)	Explain the magnus effect in brief.	7M	CO5	L2

15-12-2023 (FN)

Q.P. Code: 1803403 | SET - 2

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

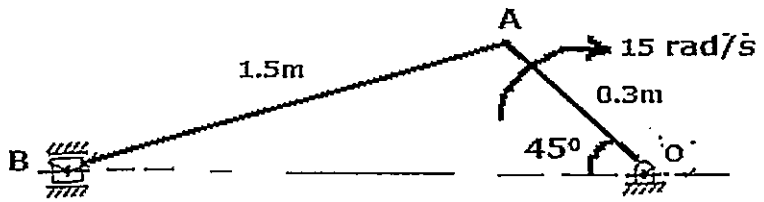
B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Kinematics of Machinery (ME)

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

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

			M	CO	BL
		UNIT - I			
1.	(a)	Explain the term kinematic link. Give the classification of kinematic link.	7M	CO1	L2
	(b)	What is the significance of degrees of freedom of a kinematic chain when it functions as a mechanism? Give examples.	7M	CO1	L1
		(OR)			
2.		Sketch and describe the working of two different types of quick return mechanisms. Give examples of their applications. Derive an expression for the ratio of times taken in forward and return stroke for one of these mechanisms.	14M	CO1	L2
		UNIT – II			
3.		Prove that a point on one of links of a Hart mechanism traces a straight line on the movement of its links.	14M	CO2	L2
		(OR)			
4.		What is an automobile steering gear? What are its types? Explain with neat sketches.	14M	CO2	L1
		UNIT – III			
5.		Locate all the instantaneous centres of the slider crank mechanism as shown in Fig. Find: (i) Velocity of piston and (ii) angular velocity of connecting rod.	14M	CO3	L3



(OR)

6.		Explain how the coriolis component of acceleration arises when a point is rotating about some other fixed point and at the same time its distance from the fixed point varies.	14M	CO3	L2
		UNIT – IV			
7.		The following data relate to a cam profile in which the follower moves with uniform acceleration and deceleration during the ascent and the descent. Minimum radius of cam = 25mm, Roller diameter = 7.5mm, Lift = 28mm, Angle of ascent = 60°, Angle of descent = 90°, Angle of dwell between ascent and descent = 45°, Speed of the cam = 200rpm. Draw the profile of the cam and determine the maximum velocity and acceleration during the outstroke and the return stroke.	14M	CO4	L3
		(OR)			

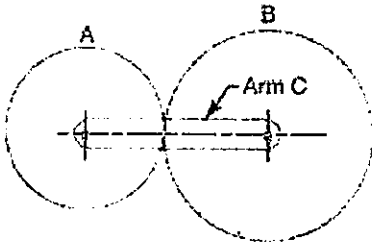
8.	Draw the profile of the cam operating a knife-edge follower having a lift of 30mm. the cam raises follower with SHM for 150° of the rotation followed by a period of dwell for 60°. The follower descends for the next 100° rotation of the cam with uniform velocity, again followed by a dwell period. The cam rotates at a uniform velocity of 120rpm and has a least radius of 20mm. What will be the maximum velocity and acceleration of the follower during the lift and the return?	14M	CO4	L3

UNIT-V

9.	Calculate i) Length of path of contact ii) Arc of contact iii) Contact ratio, when the pinion having 23teeth drives a gear having teeth 57. The profile of the gear is involute with pressure angle 20^0, module 8mm and addendum equal to one module. Determine also the sliding velocity at the instant, engagement commences and engagement terminates. When the pitch line velocity is 1.2 m/sec.	14M	CO5	L3

(OR)

10.	In an epicyclic gear train shown in figure, an arm carries two gears A and B having 36 and 45 teeth respectively. If the arm rotates at 150 rpm in the anticlockwise direction about the centre of the gear A which is fixed, determine the speed of gear B. If the gear A instead of being fixed makes 300 rpm in the clockwise direction, what will be the speed of gear B.	14M	CO5	L3



Q.P. Code: 1814404 | SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023
SUB: Basic Electronic Engineering (ME)

Time: 3 Hours | Max. Marks: 70

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

			M	CO	BL
		UNIT - I			
1.	(a)	With neat diagram explain the operation of Photo Diode	7M	CO1	L2
	(b)	Explain breakdown mechanisms in Zener diode.	7M	CO1	L2
		(OR)			
2.	(a)	Derive the expression for Ripple factor of Full Wave Rectifier.	7M	CO1	L3
	(b)	Compare FWR and Bridge Rectifier.	7M	CO1	L2
		UNIT – II			
3.	(a)	Explain the working of PNP transistor.	7M	CO2	L2
	(b)	How transistor act as a Switch.	7M	CO2	L2
		(OR)			
4.		Explain the CC configuration of BJT and its input and output characteristics briefly.	14M	CO2	L2
		UNIT – III			
5.		Explain the CS configuration of JFET and its output and tranfer characteristics.	14M	CO3	L2
		(OR)			
6.	(a)	Compare BJT and JFET.	6M	CO3	L2
	(b)	Analyze how JFET act as an amplifier.	8M	CO3	L4
		UNIT – IV			
7.	(a)	With neat diagram explain the construction and working principle of a Hartley Oscillator.	7M	CO4	L2
	(b)	With neat diagram explain the construction and working principle of a Crystal Oscillator.	7M	CO4	L2
		(OR)			
8.		What is feedback? Derive feedback expression and explain advantages and disadvantages of feedback.	14M	CO4	L3
		UNIT-V			
9.	(a)	With the help of neat diagrams explain the working of Digital Voltmeter	7M	CO5	L2
	(b)	With the help of neat diagrams explain the working of Integrating Voltmeter	7M	CO5	L2
		(OR)			
10.	(a)	With the help of neat diagrams explain measurement of Voltage using CRO	7M	CO5	L2
	(b)	With the help of neat diagrams explain measurement of frequency using CRO	7M	CO5	L2

Q.P. Code: 1803405

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023
SUB: Instrumentation and Control Systems (ME)

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

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

			Marks	CO	BL
		UNIT - I			
1.	(a)	Write a short on the basic principles of measurement.	7M	CO1	L2
	(b)	Distinguish between direct and indirect methods of measurements.	7M	CO1	L1
		(OR)			
2.	(a)	Define measurement and explain its significance in our day to day life.	7M	CO1	L1
	(b)	Explain the various elements of generalized measurement system with a neat sketch.	7M	CO1	L3
		UNIT – II			
3.	(a)	Write a short note on bellow gauges for measurement of pressure.	7M	CO2	L1
	(b)	Explain the inductive transducer for the measurement of displacement.	7M	CO2	L1
		(OR)			
4.	(a)	Explain the working of Mcleod pressure gauge with neat diagram.	7M	CO2	L2
	(b)	Explain the working principle of thermocouple with a block diagram.	7M	CO2	L2
		UNIT – III			
5.	(a)	Explain the principle of working of vibrometer.	7M	CO3	L1
	(b)	Explain the working of magnetic flow meter with neat sketch	7M	CO3	L1
		(OR)			
6.	(a)	Explain the working of Non-contact electrical tachometer with neat sketch	7M	CO3	L2
	(b)	Describe the different methods used for measurement of speed and explain their advantages and disadvantages.	7M	CO3	L2
		UNIT – IV			
7.	(a)	Discuss the various types of strain gauges for different applications.	7M	CO4	L2
	(b)	Explain the method of usage of resistance strain gauges for bending, compressive and tensile strains.	7M	CO4	L1
		(OR)			
8.	(a)	Explain about the wire type strain gauge.	7M	CO4	L1
	(b)	List out the main advantages of semi-conductor strain gauges.	7M	CO4	L1
		UNIT-V			
9.	(a)	How can you detect the moisture content of gases and explain any one method of it.	7M	CO5	L1
	(b)	Write a short note on absorption psychrometer with neat sketch.	7M	CO5	L2
		(OR)			
10.	(a)	What is a closed loop system? Show the various elements of closed loop system and list out the functions of each element.	7M	CO5	L1
	(b)	Explain the working principle of torsion meter with neat sketch.	7M	CO5	L1

Q.P. Code: 1823401

SET - 2

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

B. Tech. IV Semester (R18UG) Supplementary Examinations of Julyy – 2023

SUB: Biology for Engineers (ECE, CSE)

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

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

			Marks	CO	BL
		UNIT - I			
1.	(a)	Build and explain the structure of a Prokaryotic cell?	7M	CO1	L3
	(b)	Arrange the stages of cell cycle.	7M	CO1	L4
		(OR)			
2.	(a)	Detect the functions of the cell organelles of a plant cell with the help of a neat diagram.	7M	CO1	L4
	(b)	Identify the components and functions of protoplasm.	7M	CO1	L3
		UNIT – II			
3.	(a)	Prioritize the structural types of proteins in detail.	7M	CO2	L5
	(b)	Differentiate the structure of DNA and RNA with neat diagrams.	7M	CO2	L4
		(OR)			
4.	(a)	Explain the structure and types of RNA.	7M	CO2	L2
	(b)	Outline the structure and classification of amino acids.	7M	CO2	L4
		UNIT – III			
5.	(a)	Show the organs of respiratory system with brief explanation.	7M	CO3	L2
	(b)	List the similarities and differences between aerobic and anaerobic respiration.	7M	CO3	L3
		(OR)			
6.	(a)	Sketch a neat labeled diagram of excretory system with brief explanation.	7M	CO3	L3
	(b)	Summarize the relationship between carbon dioxide, oxygen and hemoglobin.	7M	CO3	L2
		UNIT – IV			
7.	(a)	Explain how genes are organized in eukaryotes.	7M	CO4	L2
	(b)	Distinguish between prokaryotic and eukaryotic DNA replication.	7M	CO4	L4
		(OR)			
8.	(a)	Demonstrate the process of transcription in eukaryotes.	7M	CO4	L2
	(b)	Explain in detail the industrial applications of recombinant DNA technology.	7M	CO4	L2
		UNIT-V			
9.	(a)	Structure the steps in production of vaccines.	7M	CO5	L4
	(b)	Analyze how bio-fuel can help in present fuel crisis?	7M	CO5	L4
		(OR)			
10.	(a)	Examine the types of biosensors and their applications in different engineering fields.	7M	CO5	L4
	(b)	Analyze the recent developments in the use of tissue engineering in medicine.	7M	CO5	L4

Q.P. Code: 1804402 | SET - 2

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

B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Probability Theory and Stochastic Processes (ECE)

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

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

			Marks	CO	BL
		UNIT - I			
1.	(a)	Explain the concept of total probability.	7M	CO1	L2
	(b)	State and Prove the Baye's Theorem.	7M	CO1	L2
		(OR)			
2.		In a box there are 100 resistances having resistance and tolerance shown in below table. If a resistor is chosen with same likelihood of being chosen for the three events, A as "draw a 47 ohm resistor", B as "draw a resistor with 5% tolerance", C as "draw a 100 ohm resistor", determine joint probabilities and conditional probabilities	14M	CO1	L2

RESISTANCE (Ohm)	Tolerance		
	5%	10%	Total
22	10	14	24
44	28	16	44
100	24	8	32
Total	62	38	100

		UNIT – II			
3.		A random variable X under goes the transformation $y = \frac{a}{x}$, where 'a' is a real number. Find the density function of y.	14M	CO2	L2
		(OR)			
4.		The density function of a random variable X is given by $fx(x) = \begin{cases} 2e^{-2x}, & 0 \le x < \infty \\ 0, & elsewhere \end{cases}$ Find i) E(X) ii) E(4X-1) iii) $E(X^2)$	14M	CO2	L2
		UNIT – III			
5.		Two Random Variables X and Y have a joint probability density function $fxy(x,y) = \begin{cases} \frac{5}{16}x^2 y, & 0 < y < x < 2 \\ 0, & elsewhere \end{cases}$ Find the i) Marginal density function of X and Y. ii) Are X and Y statistically independent	7M	CO3	L2
		(OR)			
6.		Write and define the equation for Joint density function and prove its properties	14M	CO3	L2
		UNIT – IV			
7.		A random process is defined by Y(t)= X(t) $\cos(\omega_0 t+\theta)$ where X(t) is WSS random process that amplitude modulates a carrier of constant angular frequency ω_0 with a random phase θ independent of X(t) and uniformly distributed on $(-\prod,\prod)$. Is Y(t) a WSS random process.	14M	CO4	L2
		(OR)			
8.		Define and explain stationarity of a random process X(t) and its types.	14M	CO4	L2
		UNIT-V			
9.	(a)	Deduce the expression for auto correlation function of system response	7M	CO5	L2
	(b)	Briefly discuss about System evaluation using random noise	7M	CO5	L2
		(OR)			
10.		Explain the following i) Properties of band limited processes. ii) Arbitrary Noise Sources.	14M	CO5	L2

Q.P. Code: 1804403

SET - 2

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

B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Analog and Digital Circuits (ECE)

Time: 3 Hours | Max. Marks: 70

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

			M	CO	BL
		UNIT - I			
1.	(a)	Draw the small-signal equivalent circuit for an emitter-follower stage at high frequencies.	7M	CO1	L4
	(b)	Obtain expressions for voltage gain, input and output admittance of Common Drain Amplifier at High frequencies with relevant circuit diagrams.	7M	CO1	L5
		(OR)			
2.	(a)	Explain the high frequency response of FET amplifier	7M	CO1	L2
	(b)	Explain the small signal model of FET and derive the expressions for voltage gain, input impedance, output impedance of CS amplifier.	7M	CO1	L2
		UNIT – II			
3.	(a)	Prove that for any periodic input waveform the average level of the steady-state output signal from the RC high pass circuit is always zero	7M	CO2	L5
	(b)	A square wave whose peak-to-peak amplitude is 2V extends ±1V with respect to ground. The duration of the positive section is 0.1 sec and that of the negative section is 0.2 sec. If this waveform is impressed upon an RC integrating circuit whose time constant is 0.2 sec, Evaluate the steady state maximum and minimum values of the output waveform.	7M	CO2	L6
		(OR)			
4.	(a)	Explain the operation of Darlington amplifier circuit and compare its input impedance characteristic with other multistage circuits	7M	CO2	L2
	(b)	Explain the operation of boot strap sweep circuit with neat diagram	7M	CO2	L3
		UNIT – III			
5.	(a)	Draw the four types of feedback amplifiers and explain them briefly	7M	CO3	L1
	(b)	Draw the circuit diagram of a current series feedback amplifier and derive expression for voltage gain with and without feedback	7M	CO3	L2
		(OR)			
6.	(a)	Draw the feedback circuit of a Hartley oscillator. Derive the expression for frequency of oscillations in Hartley oscillator	7M	CO3	L3
	(b)	State and explain conditions for generating oscillations. Discuss about the operation of RC phase oscillator	7M	CO3	L1
		UNIT – IV			
7.	(a)	What are the advantages and disadvantages of push pull configuration? Show that in class-B push pull amplifier the maximum conversion efficiency is 78.5%.	7M	CO4	L3
	(b)	With suitable diagram explain the operation of class-A power amplifier.	7M	CO4	L2
		(OR)			
8.	(a)	Define Q factor. Discuss the importance of tuned amplifiers.	7M	CO4	L2
	(b)	Sketch and explain the operation of stagger tuned amplifier	7M	CO4	L2
		UNIT-V			
9.	(a)	What is the major difference between TTL and ECL? Why does the propagation delay occur in logic circuits? Explain	7M	CO5	L4
	(b)	Compare the performance of RTL, DTL and TTL families	7M	CO5	L2
		(OR)			
10.	(a)	Realize AND gate, NOT gate and OR gate using diodes	7M	CO5	L5
	(b)	Compare TTL and MOS technologies	7M	CO5	L2

Q.P. Code: 1804405

SET - 2

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

B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Linear IC Applications (ECE)

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

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

			M	CO	BL
		UNIT - I			
1.	(a)	Discuss the need of level translator in OP-AMP.	7M	CO1	L2
	(b)	Draw the block diagram of a IC741 OP-AMP and discuss its features.	7M	CO1	L3
		(OR)			
2.	(a)	Draw and explain the transfer characteristics of Differential Amplifier.	7M	CO1	L3
	(b)	Define the following terms i) CMRR ii) Slew rate iii) Offset bias voltage	7M	CO1	L1
		UNIT – II			
3.	(a)	Derive an expression for the output voltage and gain of a non-inverting OP-AMP.	7M	CO2	L3
	(b)	Explain with a neat circuit diagram the working of voltage to current converter.	7M	CO2	L2
		(OR)			
4.	(a)	Compare Ideal Inverting and Non-Inverting Amplifiers.	7M	CO2	L4
	(b)	How does an OP-AMP work as an integrator?	7M	CO2	L1
		UNIT – III			
5.	(a)	Describe the basic principle operation of OP-AMP based comparator.	7M	CO3	L2
	(b)	Design an OP-AMP based a stable multivibrator to generate a square waveform of frequency 2 kHz.	7M	CO3	L4
		(OR)			
6.	(a)	Construct a Schmitt trigger circuit using OP-AMP and derive the threshold voltages.	7M	CO3	L2
	(b)	Recall the design procedure of a second order low pass filter.	7M	CO3	L1
		UNIT – IV			
7.	(a)	With a neat sketch, explain the operation of Wien Bridge oscillator.	7M	CO4	L2
	(b)	Explain any two applications of PLL.	7M	CO4	L3
		(OR)			
8.	(a)	Develop a circuit that generates the square wave using IC555 timer.	7M	CO4	L3
	(b)	Draw the block diagram of IC565 PLL and explain its operation.	7M	CO4	L3
		UNIT-V			
9.	(a)	Draw and explain the operation of weighted resistor DAC.	7M	CO5	L3
	(b)	Illustrate working principle of direct type ADC.	7M	CO5	L2
		(OR)			
10.	(a)	Outline the working of Inverted R-2R DAC.	7M	CO5	L2
	(b)	Explain with diagram and waveforms, the working principle of a dual slope ADC.	7M	CO5	L2

Q.P. Code: 1804406

SET - 2

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

B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Electromagnetic Theory and Transmission Lines (ECE)

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

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

			M	CO	BL
		UNIT - I			
1.	(a)	State and derive the expression for Coulombs Law.	7M	CO1	L1
	(b)	Derive the expression for electric field intensity due to surface charge	7M	CO1	L2
		(OR)			
2.	(a)	State and prove Guass law.	7M	CO1	L1
	(b)	Derive the expression for parallel plate capacitance.	7M	CO1	L2
		UNIT – II			
	(a)	State and derive the expression for Ampere Circuital law.	7M	CO2	L1
	(b)	Derive the expression for magnetic field intensity of an infinitely long coaxial transmission line	7M	CO2	L2
		(OR)			
4.	(a)	Briefly explain about magnetic scalar and vector potential.	7M	CO2	L1
	(b)	Explain about the various forces exerted in magnetic fields.	7M	CO2	L2
		UNIT – III			
5.	(a)	Write the maxwell's equation in final forms in both integral and differential form.	7M	CO3	L1
	(b)	State and derive the equation for Faraday's law	7M	CO3	L2
		(OR)			
6.	(a)	Two extensive homogeneous isotropic dielectrics meet on plane x = 0. For z > 0, er1 = 3 and for z < 0, er2 = 2.5 . A uniform electric fux density D1= 3a,+2ay - 5az kV/m exists for z> 0. a)Find D2? (b) The angles D1 and D2 make with the interface	7M	CO3	L3
	(b)	Derive the boundary condition for conductor -dielectric case.	7M	CO3	L2
		UNIT IV			
7.	(a)	Derive the equation for α and β in a lossless and lossy medium.	7M	CO4	L3
	(b)	Explain the concept of wave propagation in good conductors and good dielectrics.	7M	CO4	L2
		(OR)			
8.	(a)	Explain the reflection and refraction of a plane waves in case of oblique incidence.	7M	CO4	L3
	(b)	State and prove pointing theorem.	7M	CO4	L2
		UNIT-V			
9.	(a)	Derive the condition for a distortion less and lossless transmission line.	7M	CO5	L2
	(b)	Define characteristic impedance, Propagation constant, Phase and group velocity.	7M	CO5	L1
		(OR)			
10.	(a)	Write a short note on Smith chart.	7M	CO5	L1
	(b)	Define the following terms:	7M	CO5	L1
		(i) Input Impedance (ii) Characteristic Impedance			
		(iii) Reflection Coefficient (iv) VSWR			

Q.P. Code: 1821402 | SET - 2

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

B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Probability & Statistics (CSE)

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

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

			Marks	CO	BL
		UNIT - I			
1.	(a)	A random variable X has the following probability function:	7M	CO1	O4

x	-2	-1	0	1	2	3
$p(x)$	0.1	k	0.2	$2k$	0.3	k

Calculate expectation of X.

	(b)	Is the function defined by $f(x) = \begin{cases} 0, & \text{for } x < 2 \\ \frac{1}{18}(2x+3), & 2 \le x \le 4 \\ 0, & \text{for } x > 4 \end{cases}$ a probability density function? Find the probability that a variate having $f(x)$ as density function will fall in the interval [2,3].	7M	CO1	L3
		(OR)			
2.		Two dice are thrown. Let X assign to each point (a, b) in sample space S is the maximum of its numbers. Find the probability distribution. Also, find the mean and variance of the distribution.	14M	CO1	L3
		UNIT – II			
3.	(a)	The mean and variance of a binomial distribution are 4 and $\frac{4}{3}$. Find $P(X \ge 2)$	7M	CO2	L3
	(b)	A random variable X has a uniform distribution over (-3,3), find k for which $P(X > k) = \frac{1}{3}$. Also, calculate $P(X < 2)$ and $P(\lvert X - 2 \rvert < 2)$.	7M	CO2	L4
		(OR)			
4.	(a)	In a normal distribution, 7% of the items are under 35 and 89% are under 63. Find the mean and variance of the distribution.	7M	CO2	L4
	(b)	In a certain factory turning out razor blades, there is a small chance of 0.002 for any blade to be defective. The blades are supplied in packets of 10, use Poisson distribution to calculate the approximate number of packets containing no defective, one defective and two defective blades respectively in a consignment of 10,000 packets.	7M	CO2	L4
		UNIT – III			
5.	(a)	A sample of height of 6400 soldiers has a mean of 67.85 inches and a standard deviation of 2.56 inches while a simple sample of heights of 1600 sailors has a mean 68.55 inches and a standard deviation of 2.52 inches. Does the data indicate that the sailors are on the average taller than soldiers?	7M	CO3	L4
	(b)	In a sample of 1000 people in Karnataka 540 are rice eaters and the rest are wheat eaters. Can we assume that both rice and wheat eaters are equally popular in this state at 1% level of significance?	7M	CO3	L3
		(OR)			
6.	(a)	It is claimed that a random sample of 49 tyres has a mean life of 15200Km. This sample was drawn from a population whose mean is 15150 Km and a standard deviation of 1200 Km. Test the significance at 0.05 level.	7M	CO3	L3
	(b)	Random samples of 400 men and 200 women were asked whether they would like to have a busstop near their residence. 200 men and 40 women were in favour of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal are same at 5% level.	7M	CO3	L4

UNIT – IV

7. (a) The following data relate to the marks obtained by 11 students in two tests, one held at beginning of a year and the other at the end of the year after intensive coaching. **7M CO4 L3**

Test 1	19	23	16	24	17	18	20	18	21	19	20
Test 2	17	24	20	24	20	22	20	20	18	22	19

Do the data indicate that the students have benefited by coaching?

(b) Two random samples gave the following results. **7M CO4 L4**

Sample	Size of the Sample	Sample Mean	Sum of Squares of Deviation from the Mean
1	10	15	90
2	12	14	108

Test whether the two samples have the same variance?

(OR)

8. (a) Two independent samples of 8 & 7 items respectively by the following data. **7M CO4 L4**

Sample 1	11	11	13	11	15	9	12	14
Sample 2	9	11	10	13	9	8	10	-

Is the difference between the mean of the samples significant?

(b) A die is thrown 264 times with the following results. **7M CO4 L3**

Number appeared on the die	1	2	3	4	5	6
Frequency	40	32	28	58	54	52

Show that the die is biased at 5% level of significance.

UNIT-V

9. The following data show the values of sample mean and range for 10 samples for size of 6 each. Calculate the values for central line and the control limits for mean and range charts. Draw the control charts and comment on the state of control. **14M CO5 L4**

Sample No.	1	2	3	4	5	6	7	8	9	10
Mean	43	49	37	44	45	37	51	46	43	47
Range	5	6	5	7	7	4	8	6	4	6

(OR)

10. (a) If the average fraction defective of a large sample of products is 0.1537. Calculate the control limits for p-chart where size of the sample is 2000. **7M CO5 L3**

(b) Construct a control chart for c i.e. the number of defectives from the following data pertaining to the number of imperfections in 20 pieces of cloth of same length in a certain make of polyster and infer whether the process is in state of control? **7M CO5 L4**

2, 3, 5, 8, 12, 2, 3, 4, 6, 5, 6, 5, 6, 10, 4, 6, 5, 7, 9, 3.

Q.P. Code: 1805403

SET - 2

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

B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Computer Organization (CSE)

Time: 3 Hours | Max. Marks: 70

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

			M	CO	BL
		UNIT - I			
1.	(a)	With a general block diagram, explain the functions of the processor registers	7M	CO1	L2
	(b)	Describe the Basic Computer Organization	7M	CO1	L4
		(OR)			
2.	(a)	Describe the implementation of fixed point and floating point addition, subtraction operations.	7M	CO1	L4
	(b)	Convert the following binary numbers into hexadecimal and decimal numbers: (i) 1000011000 (ii)10000000 (iii) 101010101010	7M	CO1	L2
		UNIT – II			
3.	(a)	Explain about Arithmetic logic shift unit with neat diagram	7M	CO2	L2
	(b)	Differentiate Register Reference and Input/output Instructions	7M	CO2	L4
		(OR)			
4.	(a)	Explain in detail about different instruction types and instruction sequencing	7M	CO2	L2
	(b)	Explain instruction set Architecture? Give examples	7M	CO2	L2
		UNIT – III			
5.	(a)	Write short notes on (i) Micro instruction format (ii) Symbolic micro instruction	7M	CO3	L1
	(b)	Explain any four addressing modes in detail	7M	CO3	L2
		(OR)			
6.	(a)	Explain the importance of different addressing modes in computer architecture with suitable example	7M	CO3	L2
	(b)	Explain multiple bus organization in detail	7M	CO3	L2
		UNIT – IV			
7.	(a)	Explain instruction pipelining.	7M	CO4	L2
	(b)	Explain different types of hazards that occur in a pipeline	7M	CO4	L2
		(OR)			
8.	(a)	What do you mean by virtual memory? Discuss how paging helps in implementing virtual memory.	7M	CO4	L1
	(b)	Discuss different ways of improving the cache performance	7M	CO4	L6
		UNIT-V			
9.	(a)	Give comparison between memory mapped I/O and I/O mapped I/O	7M	CO5	L1
	(b)	Explain the action carried out by the processor after occurrence of an interrupt	7M	CO5	L2
		(OR)			
10.	(a)	Explain various data transfer modes used in DMA	7M	CO5	L2
	(b)	Describe the working principle of USB	7M	CO5	L4

Q.P. Code: 1805404 | SET - 2

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

B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Operating Systems (CSE)

Time: 3 Hours | Max. Marks: 70

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

			M	CO	BL
		UNIT – I			
1.	(a)	Justify the word resource manager with suitable explanation.	7M	CO1	L1
	(b)	How an operating system works in a computer? Explain.	7M	CO1	L1
		(OR)			
2.	(a)	Define system program. Differentiate system call with system program	7M	CO1	L2
	(b)	Discuss any two types of systems	7M	CO1	L2
		UNIT – II			
3.	(a)	What is process? Why CPU scheduling is required? Justify.	7M	CO2	L3
	(b)	Find out the average waiting time and through put time for the following process execution using RR method. Quantum time = 2	7M	CO2	L3

Process	Burst Time
P1	7
P2	12
P3	2
P4	6
P5	5

		(OR)			
4.	(a)	What is role of critical –section? Explain.	7M	CO2	L4
	(b)	Enumerate the need of semaphores.	7M	CO2	L3
		UNIT – III			
5.	(a)	Justify the hardware support for paging	7M	CO3	L4
	(b)	Explain with neat diagram the execution of inverted page table	7M	CO3	L3
		(OR)			
6.	(a)	State the purpose of segmentation. Explain.	7M	CO3	L3
	(b)	Discuss on FIFO page scheduling method with suitable example	7M	CO3	L4
		UNIT – IV			
7.	(a)	Enumerate the Banker's algorithm with suitable example	7M	CO4	L4
	(b)	Explain the steps to prevent and recover deadlock.	7M	CO4	L3
		(OR)			
8.	(a)	Discuss the types of directory structure.	7M	CO4	L3
	(b)	In what ways file, sharing could be done.	7M	CO4	L3
		UNIT-V			
9.	(a)	Elaborate the principles of system protection	7M	CO5	L3
	(b)	How to implement access matrix?	7M	CO5	L3
		(OR)			
10.	(a)	Why system security is important? Discuss.	7M	CO5	L4
	(b)	Explain the different program threats that affect the computer system	7M	CO5	L3

Q.P. Code: 1805405

SET - 2

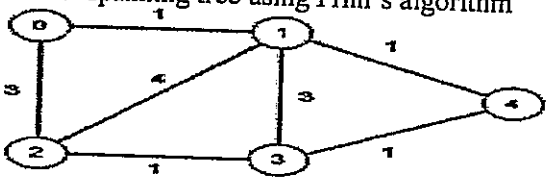
K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Design and Analysis of Algorithms (CSE)

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

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

			M	CO	BL
		UNIT - I			
1.	(a)	Construct the recursive and iterative algorithms for finding the reverse of a given string and analyze time and space complexities.	7M	CO1	L3
	(b)	Discuss the concepts of asymptotic notations and its properties.	7M	CO1	L2
		(OR)			
2.	(a)	Differentiate between Big-Oh and Little-oh notation with example.	7M	CO1	L2
	(b)	Construct Weighted Union and Collapsing Find algorithms with suitable examples.	7M	CO1	L3
		UNIT – II			
3.	(a)	Give the general procedure of divide and conquer method.	7M	CO2	L2
	(b)	Apply quick sort algorithm to sort the list. E, X, A, M, P, L, E in alphabetical order and analyze the average case time complexity of Quick sort.	7M	CO2	L4
		(OR)			
4.	(a)	Construct minimum cost spanning tree using Prim's algorithm 	7M	CO2	L3
	(b)	Define Greedy Technique, Feasible solution and optimal solution. Write general algorithm, of greedy method.	7M	CO2	L2
		UNIT – III			
5.	(a)	Construct a system with multiple devices connected parallel in three stages. The costs of the devices are 25, 10 and 15 respectively. The cost of the system is to be no more than 100. The reliability of each device type is 0.8, 0.7 and 0.4 respectively.	7M	CO3	L3
	(b)	What does dynamic programming has in common with divide-and-Conquer?	7M	CO3	L2
		(OR)			
6.	(a)	Find the shortest tour of traveling sales person for the following cost matrix using dynamic Programming. $\begin{bmatrix} \infty & 12 & 5 & 7 \\ 11 & \infty & 13 & 6 \\ 4 & 9 & \infty & 18 \\ 10 & 3 & 2 & \infty \end{bmatrix}$	7M	CO3	L3
	(b)	Write the advantages and disadvantages of Dynamic Programming.	7M	CO3	L2
		UNIT – IV			
7.	(a)	Illustrate various techniques for Binary Tree.	14M	CO4	L3
		(OR)			
8.	(a)	Apply the backtracking algorithm to solve the following instance of the sum of subsets problem S={5,10,12,13,15,18} and d=30	7M	CO4	L3
	(b)	Explain the Graph – coloring problem. And draw the state space tree for m= 3colors n=4 vertices graph. Discuss the time and space complexity.	7M	CO4	L3
		UNIT-V			
9.	(a)	What is branch & bound? Explain the role of bounding function in it using LC – search.	7M	CO5	L2
	(b)	Draw the portion of the state space tree generated by LCBB for the knapsack instance: n=5,(p1,p2,p3,p4,p5)=(w1,w2,w3,w4,w5)=(4,4,5,8,9), and m=15.	7M	CO5	L3
		(OR)			
10.	(a)	What are the differences between FIFO and LC branch and bound solutions?	7M	CO5	L2
	(b)	List two problems that have polynomial time algorithms justify your answer.	7M	CO5	L2

Q.P. Code: 1805406

SET - 2

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

B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Java Programming (CSE)

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

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

			M	CO	BL
		UNIT - I			
1.	(a)	Explain method overloading concept with suitable example.	7M	CO1	L3
	(b)	Write short note on this keyword with an example program.	7M	CO1	L3
		(OR)			
2.	(a)	What is meant by Data Abstraction? Explain how it is implemented in java.	7M	CO1	L2
	(b)	Explain Java Buzz words.	7M	CO1	L2
		UNIT – II			
3.	(a)	What are the differences between overriding and overloading? Explain with sample program.	7M	CO2	L2
	(b)	Illustrate the use of super keyword with an example.	7M	CO2	L3
		(OR)			
4.	(a)	Define multilevel inheritance. Write a program to implement multilevel inheritance	7M	CO2	L3
	(b)	How to define and implement an interface? Explain with an example program.	7M	CO2	L3
		UNIT – III			
5.	(a)	How to create user defined exceptions? Explain.	7M	CO3	L2
	(b)	Write a java program to illustrate the use of isAlive() and join() methods.	7M	CO3	L3
		(OR)			
6.	(a)	How to place multiple catch statements to handle exception? Write an example program with one try and multiple catch blocks.	7M	CO3	L3
	(b)	Write a java program to illustrate thread priorities.	7M	CO3	L3
		UNIT – IV			
7.	(a)	Discuss delegation event model for event handling in Java. Explain with a simple program.	7M	CO4	L3
	(b)	Explain keyboard events handling with an example program.	7M	CO4	L3
		(OR)			
8.	(a)	What are different types of controls in AWT? Explain.	7M	CO4	L2
	(b)	Explain the use of interface in event handling.	7M	CO4	L2
		UNIT-V			
9.	(a)	What is the use of applet? Explain with an example program.	7M	CO5	L3
	(b)	How to create a main menu by using swings with suitable program?	7M	CO5	L3
		(OR)			
10.	(a)	Describe the way to pass parameters to an applet with example program.	7M	CO5	L3
	(b)	Write a short note on JComboBox, JTree and JButton Class.	7M	CO5	L2

Q.P. Code: 1805407 | SET - 2

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

B. Tech. IV Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Formal Languages and Automata Theory (CSE)

Time: 3 Hours | Max. Marks: 70

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

			M	CO	BL
		UNIT – I			
1.	(a)	Define Finite Automata and Transition Diagram.	7M	CO1	L1
	(b)	Construct the Mealy machine equivalent to the Moore machine M defined by the following table.	7M	CO1	L5

State	a=0	a=1	output
q1	q1	q2	0
q2	q1	q3	0
q3	q1	q3	1

(OR)

2.	(a)	Let Σ = {a, b}, a) Give DFA that accepts any string with aababb as a substring.	7M	CO1	L4
	(b)	Define NFA. What are the differences between DFA & NFA?	7M	CO1	L2
		UNIT – II			
3.	(a)	Explain the procedure for converting regular expression to finite automata.	7M	CO2	L2
	(b)	Construct an equivalent FA for the given regular expression (0+1)*(00+11)(0+1)*.	7M	CO2	L5
		(OR)			
4.	(a)	Construct an NFA equivalent to the regular expression (ab+aba)*.	7M	CO2	L5
	(b)	Explain Arden's theorem with an example.	7M	CO2	L2
		UNIT – III			
5.	(a)	Let the production of the grammar be S → 0B / 1A, A → 0 / 0S / 1AA, B → 1 / 1S / 0BB and the string 0110. Find the left most derivation and right most derivation tree.	7M	CO3	L4
	(b)	Construct CNF for the Grammar S->ABC, A->0B, B->CD/0, C->1.	7M	CO3	L5
		(OR)			
6.	(a)	Find a right most derivation for "aaabbabbba" with the productions. S → aB / bA, A → a /S / bAA, B → b / bS / aBB .	7M	CO3	L4
	(b)	Explain about Chomsky normal form with example.	7M	CO3	L2
		UNIT – IV			
7.	(a)	Define PDA. Design a PDA for equal number of a's and b's.	7M	CO4	L6
	(b)	Explain Deterministic Push down Automata.	7M	CO4	L2
		(OR)			
8.	(a)	A PDA is more powerful than a finite automaton. Justify this statement.	7M	CO4	L2
	(b)	Construct a PDA from the following CFG. G = ({S, A}, {a, b}, P, S) where the productions are S → AS / ε A → aAb / Sb / a	7M	CO4	L5
		UNIT-V			
9.	(a)	Define Post Correspondence Problem. Explain in brief about PCP with an example.	7M	CO5	L2
	(b)	Explain Universal Turing machine.	7M	CO5	L2
		(OR)			
10.	(a)	Discuss the advantages of Linear Bounded Automata.	7M	CO5	L4
	(b)	What is a Definition of P and NP problems? Explain NP hard problems.	7M	CO5	L2