10-07 - 2023 (FN)

Q.P. Code: 1814601

SET - 2

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

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

SUB: Basic Electronics & Sensor Technology (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)	Discuss in detail about construction and operation of a half Wave rectifier with necessary diagrams.	7M	CO1	L2
	(b)	Derive the DC current, RMS current, efficiency and ripple factor for half wave rectifier.	7M	CO1	L2
		OR			
2.	(a)	Describe the operation and characteristics of LED	7M	CO1	L2
	(b)	Explain the operation and characteristics of Zener diode.	7M	CO1	L2
		UNIT – II			
3.	(a)	Explain the operation of NPN transistor	7M	CO2	L2
	(b)	Discuss in detail about fixed bias circuit and Derive an expression for stability factor	7M	CO2	L2
		OR			
4.	(a)	Explain input and output characteristics of CB configuration.	7M	CO2	L2
	(b)	Explain the operation of PNP transistor	7M	CO2	L2
		UNIT – III			
5.	(a)	Explain the operation of n-channel JFET	7M	CO3	L2
	(b)	Derive drain and gate characteristics of n-channel JFET	7M	CO3	L2
		OR			
	(a)	Explain the working of FET as Amplifier.	7M	CO3	L2
	(b)	Compare BJT with FET.	7M	CO3	L2
		UNIT – IV			
7.	(a)	Explain the operation of LVDT	7M	CO4	L2
	(b)	Define transducer and describe active and passive transducers.	7M	CO4	L2
		OR			
8.	(a)	Explain the working of thermocouple	7M	CO4	L2
	(b)	Explain the potentiometer and loading effect	7M	CO4	L2
		UNIT-V			
9.	(a)	Explain the construction and working of astronomical telescope	7M	CO5	L2
	(b)	Describe the construction and working of Prismatic compass	7M	CO5	L2
		OR			
10.	(a)	Write the principle and operation of Gyroscope	7M	CO5	L2
	(b)	Briefly explain various types of densitometers and their applications	7M	CO5	L2

12-07-2023 (AN)

Q.P. Code: 1801602 | SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18UG) Supplementary Examinations of July – 2023
SUB: Concrete Technology (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 Bouge's compounds? Explain in detail how each one of these compounds influences the strength and setting properties of cement.	7M	CO1	L1
	(b)	Explain chemical composition of cement and process	7M	CO1	L3
		(OR)			
2.	(a)	Write about mineral admixture and chemical admixtures?	7M	CO1	L1
	(b)	Describe hydration and setting time of cement?	7M	CO1	L2
		UNIT – II			
3.	(a)	Write about alkali aggregate reaction.	7M	CO2	L1
	(b)	Describe ready mix concrete	7M	CO2	L2
		(OR)			
4.	(a)	What is maximum graded and gap graded aggregate size in concrete	7M	CO2	L1
	(b)	What are the measurements to be taken in mixing and vibration of concrete	7M	CO2	L1
		UNIT – III			
5.	(a)	What is shrinkage of concrete and what are the factors affecting shrinkage.	7M	CO3	L1
	(b)	Describe chemical attacks of concrete?	7M	CO3	L2
		(OR)			
6.	(a)	Explain air entrained concrete?	7M	CO3	L3
	(b)	Describe modulus of elasticity and dynamic modulus of concrete?	7M	CO3	L2
		UNIT – IV			
7.	(a)	What is the importance of Non-Destructive tests?	7M	CO4	L1
	(b)	Write a brief note on split tensile strength of Concrete.	7M	CO4	L1
		(OR)			
8.	(a)	What is the influence of temperature in curing of concrete	7M	CO4	L1
	(b)	Write a brief note on ultrasonic pulse velocity test method.	7M	CO4	L1
		UNIT-V			
9.	(a)	Explain the factors affecting the mix design of concrete.	7M	CO5	L3
	(b)	Describe the procedure in adopting ACI method of concrete mix design	7M	CO5	L2
		(OR)			
10.	(a)	Describe the procedure in adopting IS method of concrete mix design	7M	CO5	L2
	(b)	Design a concrete mix of M30 grade for a roof slab. Take a Standard deviation of 5MPa. The specific gravities of Coarse Aggregate and Fine Aggregate are 2.74 and 2.62 respectively. The bulk density of coarse aggregate is 1620kg/m3 and fineness modulus of fine aggregate is 2.76. A slump of 65mm is necessary. The water absorption of coarse aggregate is 1% and free moisture in fine aggregate is 2%. Design the concrete mix using IS code method. Assume any missing data suitably.	7M	CO5	L3

Q.P. Code: 1801603 | SET - 2

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

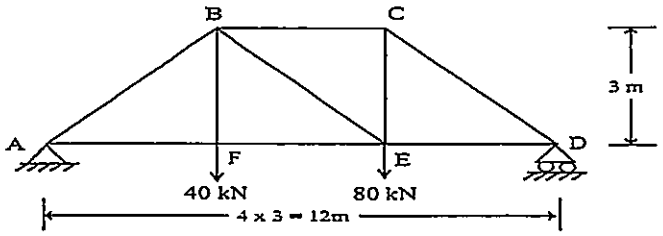
B. Tech. VI Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Structural Analysis – II (CE)

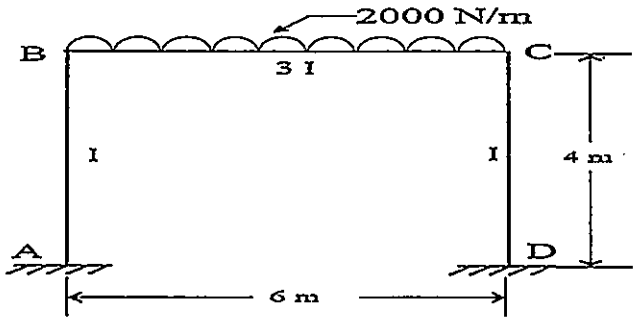
Time: 3 Hours | Max. Marks: 70

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

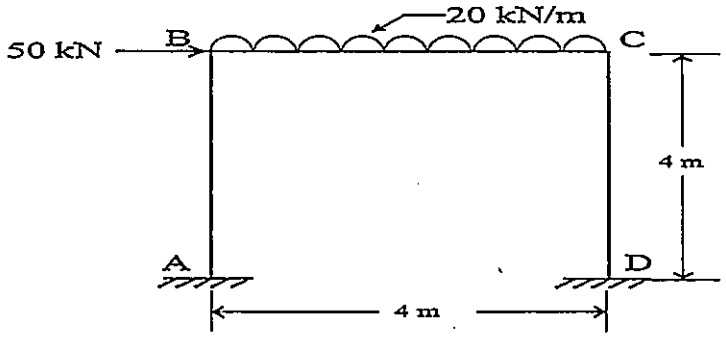
			M	CO	BL
		UNIT - I			
1.	(a)	Differentiate between the determinate and indeterminate structures.	7M	CO1	L2
	(b)	Discuss static and kinematic indeterminacy with example.	7M	CO1	L2
		(OR)			
2.		Determine the force in the members of the truss shown in figure. The cross-sectional area of vertical and horizontal members is 4000 mm^2 and that of the diagonals is 6000mm^2.	14M	CO1	L5



		UNIT – II			
3.		Analyse the continuous beam given in figure by slope deflection method.	14M	CO2	L4



		(OR)			
		Analyse the portal frame given in figure by Moment distribution method.	14M	CO2	L4



		UNIT – III			
5.		A truck and trailer combination crossing a 12 m span has axle loads of 10, 20, and 30 kN separated respectively by distances of 3 and 5 m. Compute the maximum moment and maximum shear developed in the span.	14M	CO3	L4
		(OR)			
6.		Two-point loads of 4 kN and 6 kN spaced 6m apart cross a girder, the 4kN load leading frame left to right. Construct the maximum shear force and bending moment diagram, stating the absolute maximum values.	14M	CO3	L4

12-09-2023 (FN)

Q.P. Code: 1801604

SET - 2

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

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

SUB: Design of Reinforced Concrete Structures – 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)	Explain Under Reinforced, Over reinforced and Balanced section with suitable stress diagram used in WSM.	7M	CO1	L2
	(b)	Derive the values of design constants for M20 grade of concrete is used along with Fe250, Fe415 and Fe500 with reference to WSM	7M	CO1	L3
		(OR)			
2.	(a)	A RC beam section of size 230mm wide and 430mm effective depth is reinforced with 3 no's 16mm diameter bars. Find the moment of resistance of section using WSM approach. Also find safe intensity of UDL that can be placed on simply supported beam of effective span 4m. Use M20 grade of concrete and Fe250 steel.	7M	CO1	L3
	(b)	Explain briefly WSM, ULM and LSM and their limitations	7M	CO1	L2
		UNIT – II			
3.		Design a rectangular beam for an effective span of 6m.The-superimposed load is 80kN/m and size of the beam is limited to 300mm x 700mm. Use M25 mix and Fe415 grade steel. Adopt Limit state method.	14M	CO2	L3
		(OR)			
4.	(a)	What are the assumptions for the design of a reinforced concrete section for limit state of collapse in bending?	7M	CO2	L2
	(b)	Show that the limiting depth of neutral axis for a rectangular cross section reinforced with Fe415 grade steel in 0.48d.	7M	CO2	L3
		UNIT – III			
5.		An RC beam has an effective depth of 450mm and breadth of 300mm. It contains 5-20mm bars mild steel out of which two bars curtailed at a section where shear force at service load is 100kN. Design the shear reinforcement if the concrete is M20. Adopt Limit state method.	14M	CO3	L3
		(OR)			
6.		A rectangular beam of size 230mm wide x 565 mm effective depth is subjected to a sagging bending moment of 32 kN-m, shear force 32 kN and a torsional moment of 12 kNk. Design the reinforcement at the given section. Use M25 and Mild steel reinforcement. Adopt Limit state Method.	14M	CO3	L3
		UNIT – IV			
7.		Design a two-way slab simply supported on all the four edges for a room 6m x 3.5m clear in size. The superimposed working load is 3.5 kN/m^2 for (i) corners held down and (ii) corners not held down.	14M	CO4	L3
		(OR)			
8.		Design a simply supported roof slab for a room 8.5m x 3.2m clear in size if the superimposed load is 4.5kN/m^2. Use M25 mix and Fe 500 grade steel.	14M	CO4	L3
		UNIT-V			
9.		A column 300x400mm has an unsupported length of 3m and effective length of 3.6m.If it is subjected to Pu=1100kN and Mu=230kN-m about the major axis, determine the longitudinal steel using f_{ck}=25N/mm^2 and Fe500 steel.	14M	CO5	L3
		(OR)			
10.		Design a short circular column 6m long to carry an axial load of 450kN if one end is hinged and the other end is fully restrained using (i) Lateral ties and (ii) helical steel.	14M	CO5	L3

19-03-2023 (FN)

Q.P. Code: 1801605

SET - 2

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

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

SUB: Foundation Engineering – 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)	Explain the terms 'inside clearance' and 'outside clearance' as applied to a sampler. Why are they provided?	7M	CO1	L2
	(b)	Write short notes on: (i) Geophysical methods, (ii) Penetration Tests.	7M	CO1	L2
		(OR)			
2.	(a)	Compute the area ratio of a thin walled tube samples having an external diameter of 6 cm and a wall thickness of 2.25 mm. Do you recommend the sampler for obtaining undisturbed soil samples? Why?	7M	CO1	L3
	(b)	Describe the "Standard Penetration Test" used in soil exploration.	7M	CO1	L2
		UNIT – II			
3.	(a)	A retaining wall 9 m high retains a cohesionless soil, with an angle of internal friction 33°. The surface is level with the top of the wall. The unit weight of the top 3 m of the fill is 21 kN/m3 and that of the rest is 27 kN/m3. Find the magnitude and point of application of the resultant active thrust. It is assumed that $\varphi = 33°$ for both the strata of the backfill.	7M	CO2	L3
	(b)	Explain clearly Rebhann's graphical construction method to evaluate the earth pressure on a retaining wall.	7M	CO2	L2
		(OR)			
4.	(a)	Determine the active and passive earth pressure given the following data: Height of retaining wall = 10 m; $\varphi = 25°$; $\gamma d = 17$ kN/m3. Ground water table is at the top of the retaining wall.	7M	CO2	L3
	(b)	Explain types of retaining walls with neat sketch.	7M	CO2	L2
		UNIT – III			
5.	(a)	Compute the safe bearing capacity of a continuous footing 1.8 m wide, and located at a depth of 1.2 m below ground level in a soil with unit weight $\gamma = 20$ kN/m3, c = 20 kN/m2, and $\varphi = 20°$. Assume a factor of safety of 2.5. Terzaghi's bearing capacity factors for $\varphi = 20°$ are Nc = 17.7, N q = 7.4, and $N\gamma = 5.0$, what is the permissible load per metre run of the footing	7M	CO3	L3
	(b)	What are the assumptions made in Terzaghi's analysis of bearing capacity	7M	CO3	L2
		(OR)			
6.	(a)	Determine the ultimate bearing capacity of a square footing of 1.5 m size, at a depth of 1.5 m, in a pure clay with an unconfined strength of 150 kN/m2. $\varphi = 0°$ and $\gamma = 17$ kN/m3.	7M	CO3	L3
	(b)	Explain the effect of ground water table on the safe bearing capacity.	7M	CO3	L2
		UNIT – IV			
7.	(a)	Write brief critical notes on the Engineering News Formula.	5M	CO4	L2
	(b)	A group of 16 piles of 50 cm diameter is arranged with a centre to centre spacing of 1.0 m. The piles are 9 m long and are embedded in soft clay with cohesion 30 kN/m2. Bearing resistance may be neglected for the piles — Adhesion factor is 0.6. Determine the ultimate load capacity of the pile group	9M	CO4	L3
		(OR)			

8.	(a)	Explain the function of pile foundation and show how the bearing capacity of the foundation can be estimated.	7M	CO4	L2
	(b)	A square pile group of 9 piles passes through a recently filled up material of 4.5 m depth. The diameter of the pile is 30 cm and pile spacing is 90 cm centre to centre. If the unconfined compression strength of the cohesive material is 60 kN/m2 and unit weight is 15 kN/m3, compute the negative skin friction of the pile group.	7M	CO4	L3
		UNIT-V			
9.	(a)	Write the expressions for the factor of safety using the method of slices when the slope of a homogeneous earth dam is dry and when fully submerged. Assume the soil to possess both cohesion and friction.	7M	CO5	L2
	(b)	An embankment is inclined at an angle of 35° and its height is 15 m. The angle of shearing resistance is 15° and the cohesion intercept is 200 kN/m2. The unit weight of soil is 18.0 kN/m3. If Taylor's stability number is 0.06, find the factor of safety with respect to cohesion.	7M	CO5	L3
		(OR)			
10.	(a)	Write critical notes on the friction circle method of analyzing the stability of slopes.	7M	CO5	L2
	(b)	An embankment 10 m high is inclined at an angle of 36° to the horizontal. A stability analysis by the method of slices gives the following forces per running meter: Σ Shearing forces = 450 kN Σ Normal forces = 900 kN Σ Neutral forces is 216 kN The length of the failure arc is 27 m. Laboratory tests on the soil indicate the effective values c′ and φ′ as 20 kN/m2 and 18° respectively. Determine the factor of safety of the slope with respect to (i) shearing strength and (ii) cohesion.	7M	CO5	L3

Q.P. Code: 1801606

SET - 2

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

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

SUB: Water Resources Engineering – 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)	Explain the types of Irrigation in detail.	7M	CO1	L2
	(b)	The consumptive use requirements of a crop are 0.2 cm per day for days 1 to 15, 0.3 cm per day for days 16 to 40, 0.5 cm per day for days 41 to 50 and 0.1 cm per day for days 51 to 55. Effective rainfall of 3.5 cm, distributed uniformly during period from 36th to 45th days (both inclusive) is predicted. Compute the total quantity of water (in m^3) to be delivered to a 50 hectares plot for the whole crop season with a pre-sowing requirement of 5 cm of water.	7M	CO1	L3
		(OR)			
2.	(a)	Summarize the necessity of irrigation.	7M	CO1	L2
	(b)	Explain the various factors affecting duty.	7M	CO1	L2
		UNIT – II			
3.	(a)	Illustrate the advantages and disadvantages of lining.	7M	CO2	L2
	(b)	Compare Kennedy's theory to Lacey's regime theory.	7M	CO2	L2
		(OR)			
4.		Discuss the classification of canals based on various parameters.	14M	CO2	L2
		UNIT – III			
5.		Explain the components of diversion headwork with neat sketch.	14M	CO3	L2
		(OR)			
6.	(a)	Illustrate the limitations of Bligh's creep theory.	7M	CO3	L2
	(b)	Compare the following: i. Diversion and storage head works ii. Weirs and barrages	7M	CO3	L2
		UNIT – IV			
7.	(a)	Illustrate the various parameters of site selection for reservoir.	7M	CO4	L2
	(b)	Explain the zones of storage of a reservoir.	7M	CO4	L2
		(OR)			
8.	(a)	Explain the types of dams in detail.	7M	CO4	L2
	(b)	Explain the factors affecting selection of type of dam.	7M	CO4	L2
		UNIT-V			
9.		Define gravity dam. Explain the forces acting on gravity dam with neat sketch.	14M	CO5	L2
		(OR)			
10.		Illustrate the causes of failure of earth dam.	14M	CO5	L2

Q.P. Code: 1824601

SET - 2

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

B. Tech. VI Semester (R18UG) Supple. Examinations of July – 2023

SUB: Management Science (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)	Explain the significance of line and staff originations.	7M	CO1	L1
	(b)	Explain 'Line and Staff' organization structure. What are its merits and demerits?	7M	CO1	L2
		(OR)			
2.	(a)	Write managerial objectives and social responsibilities of Management.	7M	CO1	L2
	(b)	Discuss the various types of organizations.	7M	CO1	L1
		UNIT – II			
3.	(a)	Explain the factors promoting Plant location.	7M	CO2	L1
	(b)	Differentiate between Product and Process Layouts. Also discuss the significance of these layouts.	7M	CO2	L1
		(OR)			
4.	(a)	Explain strategic formulation with a flow chart.	7M	CO2	L1
	(b)	Discuss different levels of strategy and explain the importance of strategy in making strategic decisions at different levels.	7M	CO2	L2
		UNIT – III			
5.	(a)	Explain the need of Manpower Planning.	7M	CO3	L2
	(b)	What is meant by Human Resource Management? Discuss the objectives and core elements of Human Resource Management.	7M	CO3	L2
		(OR)			
6.	(a)	Explain the Job Evaluation process.	7M	CO3	L1
	(b)	Explain in detail the costs involved in EOQ.	7M	CO3	L1
		UNIT – IV			
7.	(a)	What is p – its chart? Discuss its merits in quality control.	7M	CO4	L2
	(b)	What is sampling? Write about Acceptance sampling.	7M	CO4	L2
		(OR)			
8.	(a)	Write a note on the following: (i) Job Production Mass Production	7M	CO4	L1
	(b)	Discuss the various work measurement methods.	7M	CO4	L2
		UNIT-V			
9.	(a)	Write in detail about Supply Chain Management.	7M	CO5	L1
	(b)	Briefly write an essay on JIT and ERP.	7M	CO5	L1
		(OR)			
10.	(a)	What is the importance of Balanced Score Card in Performance management? Explain in detail about 360 Degree performance appraisal.	7M	CO5	L1
	(b)	Explain about the Capabilities Maturity Model (CMM).	7M	CO5	L2

Q.P. Code: 1802602 | SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18UG) Supplementary Examinations of July – 2023
SUB: Power Semiconductor Device (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)	State and explain the functions of various converters.	7M	CO1	L1
	(b)	How do you define passive and active load torques? What are the differences between the two?	7M	CO1	L2
		(OR)			
2.	(a)	What is the current status of DC and AC drives?	7M	CO1	L1
	(b)	Describe the fallowing (a) Loads with rotational motion (b) Loads with translational motion	7M	CO1	L1
		UNIT – II			
3.	(a)	Describe the operation of closed-loop speed control scheme with inner current control loop. What are various functions of inner current control loop?	7M	CO2	L2
	(b)	Explain the 1-φ half controlled rectifier control of separately excited DC motor and draw its output characteristics.	7M	CO2	L3
		(OR)			
4.	(a)	What do you understand by constant-torque drive and constant power drive?	7M	CO2	L2
	(b)	A 220V, 24A, 100rpm, separately excited DC motor has an armature resistance of 2Ω. Motor is controlled by a chopper with frequency of 500Hz and source voltage of 230V. Calculate the duty ratio for 1.2 times rated and 500rpm.	7M	CO2	L2
		UNIT – III			
5.	(a)	Explain the direct torque control of induction motor drive with a neat sketch.	7M	CO3	L1
	(b)	A 400V, 3-phase, 50Hz, 6 pole, 945 rpm, delta connected induction motor has the fallowing parameters referred to the stator: $R_s = 2\Omega, R_r' = 2\Omega, X_s = 3\Omega, X_r' = 5\Omega$ Motor speed is controlled by stator voltage control. When driving a fan load it runs at rated speed at rated voltage. Calculate motor terminal voltage, current and torque at 800 rpm.	7M	CO3	L3
		(OR)			
6.	(a)	With a neat sketch explain the stator voltage control of IM drive.	7M	CO3	L2
	(b)	Explain in detail the rotor side control of induction motor drive.	7M	CO3	L1
		UNIT – IV			
7.	(a)	Derive the torque expression of synchronous motor drive.	7M	CO4	L2
	(b)	Explain the self-control of brushless DC motor drive.	7M	CO4	L2
		(OR)			
8.	(a)	Discuss the applications of synchronous motor drive.	7M	CO4	L1
	(b)	With a block diagram explain the open loop operation of VSI fed synchronous motor drive.	7M	CO4	L2
		UNIT-V			
9.	(a)	Explain the energy efficient operation of drives.	7M	CO5	L2
	(b)	Describe the use of efficient converters for energy conservation in electric drives.	7M	CO5	L2
		(OR)			
10.	(a)	Explain in detail the improvement of power factor.	7M	CO5	L1
	(b)	Explain the improvement of quality of supply for energy conservation in electric drives.	7M	CO5	L1

Q.P. Code: 1802607 **SET - 2**

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

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

SUB: Signals & Systems (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)	Determine and sketch the even and odd components of a signal $x(t) = e^{-t}u(t)$.	7M	CO1	L3
	(b)	Find the trigonometric Fourier series representation of a periodic signal defined as $x(t) = A; -1 \le t \le 0;$ $= -A; 0 \le t \le 1;$ with fundamental period T= 2 sec.	7M	CO1	L3
		(OR)			
2.	(a)	Show that the two functions $\cos(n\omega_0 t)$ and $\cos(m\omega_0 t)$ are orthogonal over an interval $[t_0, t_0 + 2\pi/\omega_0)$ for integral values of m and n.	7M	CO1	L3
	(b)	Determine the exponential Fourier series representation of a periodic signal defined as $x(t) = t; 0 \le t \le 1$ with fundamental period T = 1 sec.	7M	CO1	L4
		UNIT – II			
3.	(a)	Determine the Fourier transform of a signal $x(t) = t; -1 \le t \le 1$ $= 0$; otherwise	7M	CO2	L4
	(b)	State and prove Time shifting and Frequency shifting properties of Fourier Transform.	7M	CO2	L3
		(OR)			
4.	(a)	Determine the Fourier transform of a signal $x(t) = u(t) - u(t-5)$.	7M	CO2	L3
	(b)	State and prove Time scaling and Duality properties of Fourier Transform.	7M	CO2	L3
		UNIT – III			
5.	(a)	Explain about the classification of systems with examples.	7M	CO3	L2
	(b)	Derive the relationship between bandwidth and rise time.	7M	CO3	L3
		(OR)			
6.	(a)	Draw the ideal characteristics of low pass, high pass, band pass and band stop filters.	7M	CO3	L2
	(b)	Derive the conditions for causality and stability of LTI systems.	7M	CO3	L3
		UNIT – IV			
7.	(a)	Determine the Nyquist rate and Nyquist interval for the following signals. i) $x(t) = \sin(20\pi t)$ ii) $x(t) = \text{sinc}(10\pi t)$	7M	CO4	L4
	(b)	Determine the DTFT of the signal $x(n) = (0.5)^{\lvert n \rvert}$	7M	CO4	L4
		(OR)			
8.	(a)	Explain how a signal can be reconstructed from its samples.	7M	CO4	L2
	(b)	State and Prove Frequency differentiation and convolution properties of DTFT	7M	CO4	L3
		UNIT-V			
9.	(a)	Find the Laplace transform of a signal $x(t) = e^{-2t}\cos(t)\,u(t)$.	7M	CO5	L3
	(b)	Determine Z-transform and ROC of a signal $x(n) = (n+1)\,a^n u(n)$.	7M	CO5	L3
		(OR)			
10.	(a)	State and prove time convolution and time reversal properties of Z-transform.	7M	CO5	L3
	(b)	Compute the inverse Z transform of a function $X(Z) = \frac{z+4}{(z+2)(z^2+4z+3)}$ with ROC $\lvert Z \rvert > 3$	7M	CO5	L4

Q.P. Code: 1803601 | SET - 2

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

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

SUB: Machine Tools (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)	How can you classify cutting tools?	7M	CO1	L1
	(b)	Derive the equation of chip thickness ratio and shear plane angle.	7M	CO1	L2
		OR			
2.	(a)	Show the lathe set up of thread cutting operation and explain thread cutting.	7M	CO1	L2
	(b)	Name the different types of lathes? Discuss the importance of each lathe.	7M	CO1	L2
		UNIT – II			
3.	(a)	What are the advantages, disadvantages and applications of vertical shaper?	7M	CO2	L2
	(b)	Explain working principle of shaper with neat sketch.	7M	CO2	L2
		OR			
4.	(a)	Explain the working principle of double housing planer machine with neat sketch.	7M	CO2	L2
	(b)	Explain the 4-sided planer machine.	7M	CO2	L2
		UNIT – III			
5.	(a)	Explain the working principle of radial drilling machine with neat sketch.	7M	CO3	L2
	(b)	Explain the types of drilling cutters.	7M	CO3	L2
		OR			
6.	(a)	Discuss briefly with neat sketch a horizontal boring machine.	7M	CO3	L2
	(b)	What do you mean by boring machine? What are the advantages and disadvantages?	7M	CO3	L1
		UNIT – IV			
7.	(a)	Explain the briefly up milling process and down milling process.	7M	CO4	L2
	(b)	Write short notes on straddle milling.	7M	CO4	L2
		OR			
8.	(a)	How milling machines are broadly classified.	7M	CO4	L2
	(b)	Explain column and knee type milling machine with neat sketch.	7M	CO4	L2
		UNIT-V			
9.	(a)	Explain the precision grinding machine with neat diagram.	7M	CO5	L2
	(b)	What is a grinding wheel? What are the grinding wheel parameters that influence the grinding performance?	7M	CO5	L2
		OR			
10.	(a)	Explain the elements of broaching machine.	7M	CO5	L2
	(b)	Explain the working principle of continuous broaching machine with neat diagram.	7M	CO5	L2

Q.P. Code: 1803602 | SET - 2

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

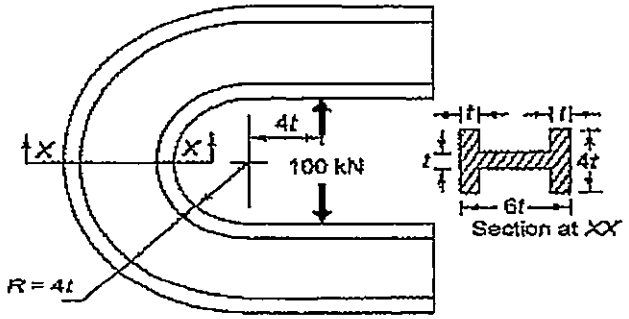
B. Tech. VI Semester (R18UG) Supplementary Examinations of July – 2023

SUB: Design of Machine Elements-II (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 helical compression spring is used to absorb the shock. The initial compression of the spring is 30 mm and it is further compressed by 50 mm while absorbing the shock. The spring is to absorb 250 J of energy during the process. The spring index can be taken as 6. The spring is made of patented and cold-drawn steel wire with an ultimate tensile strength of 1500 N/mm^2 and modulus of rigidity of 81 370 N/mm^2. The permissible shear stress for the spring wire should be taken as 30% of the ultimate tensile strength. Design the spring	14M	CO1	L4
		(OR)			
2.	(a)	A concentric spring consists of two helical compression springs having the same free length. The composite spring is subjected to a maximum force of 2000 N. The wire diameter and mean coil diameter of the inner spring are 8 and 64 mm respectively. Also, the wire diameter and mean coil diameter of the outer spring are 10 and 80 mm respectively. The number of active coils in the inner and outer springs are 12 and 8 respectively. Assume same material for two springs and the modulus of rigidity of spring material is 81370 N/mm^2. Calculate:(i) the force transmitted by each spring; (ii) the maximum deflection of the spring; and (iii) the maximum torsional shear stress induced in each spring.	7M	CO1	L3
	(b)	A carriage spring 800 mm long is required to carry a proof load of 5000 N at the center. The spring is made of plates 80 mm wide and 7.5 mm thick. If the maximum permissible stress for the material of the plates is not to exceed 190 MPa, determine :1. The number of plates required, 2. The deflection of the spring, and 3. The radius to which the plates must be initially bent. The modulus of elasticity may be taken as 205 kN/mm^2.	7M	CO1	L3
		UNIT – II			
3.		Design a journal bearing for a centrifugal pump from the following data : Load on the journal = 18 000 N; Speed of the journal = 800 r.p.m.; Type of oil is SAE 10, for which the absolute viscosity at 55°C = 0.017 kg / m-s; Ambient temperature of oil = 15.5°C ; Maximum bearing pressure for the pump = 1.6 N/ mm^2. Calculate also mass of the lubricating oil required for artificial cooling, if rise of temperature2 of oil be limited to 10°C. Heat dissipation coefficient = 1200 W/m^2/°C.	14M	CO2	L4
		(OR)			
4.	(a)	The frame of a 100 kN capacity frame is shown in fig. it is made of grey cast iron FG 300 and the factor of safety is 2.5. Determine the dimensions of the cross section at XX	7M	CO2	L3



	(b)	What are the various terms used in journal bearings analysis and design? Give their definitions in brief.	7M	CO2	L2

UNIT – III

5.		Design a belt drive to transmit 110 kW for a system consisting of two pulleys of diameters 0.9 m and 1.2 m, centre distance of 3.6 m, a belt speed 20 m / s, coefficient of friction 0.3,a slip of 1.2% at each pulley and 5% friction loss at each shaft, 20% over load.	14M	CO3	L4
		(OR)			
6.	(a)	A rolling contact bearing is subjected to the following work cycle: (a) Radial load of 6000 N at 150 r.p.m. for 25% of the time; (b) Radial load of 7500 N at 600 r.p.m. for 20% of the time; and (c) Radial load of 2000 N at 300 r.p.m. for 55% of the time. The inner ring rotates and loads are steady. Select a bearing for an expected average life of 2500hours.	7M	CO3	L3
	(b)	A ball bearing subjected to a radial load of 5 kN is expected to have a life of 8000 hours at 1450 r.p.m. with a reliability of 99%. Calculate the dynamic load capacity of the bearing so that it can be selected from the manufacturer's catalogue based on a reliability of 90%.	7M	CO3	L3
		UNIT – IV			
7.		It is required to design a pair of spur gears with 20° full-depth involute teeth based on the Lewis equation. The velocity factor is to be used to account for dynamic load. The pinion shaft is connected to a 10 kW, 1440 rpm motor. The starting torque of the motor is 150% of the rated torque. The speed reduction is 4 : 1. The pinion as well as the gear is made of plain carbon steel 40C8 (S_{ut} = 2600 N/mm). The factor of safety can be taken as 1.5. Design the gears, specify their dimensions and suggest suitable surface hardness for the gears	14M	CO4	L4
		(OR)			
8.		A pair of helical gears are to transmit 15 kW. The teeth are 20° stub in diametral plane and have a helix angle of 45°. The pinion runs at 10 000 r.p.m. and has 80 mm pitch diameter. The gear has 320 mm pitch diameter. If the gears are made of cast steel having allowable static strength of 100 MPa; determine a suitable module and face width from static strength considerations and check the gears for wear, given σ_{es} = 618 MPa	14M	CO4	L3
		UNIT-V			
9.		A connecting rod is required to be designed for a high speed, four stroke I.C. engine. The following data is available. Diameter of piston = 88 mm; Mass of reciprocating parts = 1.6 kg; Length of connecting rod (centre to centre) = 300 mm; Stroke = 125 mm; R.P.M. = 2200 (when developing 50 kW); Possible over speed = 3000 r.p.m.; Compression ratio = 6.8:1 (approximately); Probable maximum explosion pressure (assumed shortly after dead centre, say at about 3°) = 3.5 N/mm^2	14M	CO5	L4
		(OR)			
10.		Design a cast iron piston for a single acting four-stroke diesel engine with the following data Cylinder bore = 200 mm Length of stroke = 250 mm Speed = 600 rpm Brake mean effective pressure = 0.60 MPa Maximum gas pressure = 4 MPa Fuel consumption = 0.25 kg per BP per h (l/d) ratio for bush in small end of connecting rod = 1.5 Assume suitable data if required and state the assumptions you make.	14M	CO5	L4

Q.P. Code: 1803603

SET - 2

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

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

SUB: Operation Research (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 applications of operation research.	7M	CO1	L2
	(b)	Explain the operation approach to problem solving.	7M	CO1	L2
		(OR)			
2.		Solve the following LPP by Two Phase simple method. Minimize Z= 10X1+6X2+2X3 subjected to -X1+X2+X3≥1 3X1+X2-X3≥2 and X1,X2≥0	14M	CO1	L3
		UNIT – II			
3.	(a)	Following is the unit cost matrix of a transportation problem. Use MODI method to obtain the optimum basic feasible solution.	14M	CO2	L3

	D1	D2	D3	Available
S1	50	30	220	1
S2	90	45	170	3
S3	250	200	50	4
Requirement	4	2	2	

(OR)

4.		Explain the Hungarian method for solving assignment problems.					14M	CO2	L2
		UNIT – III							
5.		The following failure rates have been observed for a certain type f light bulbs. The cost of replacing individual bulb is Rs.2.25 the decision is made to replace all bulbs simultaneously at fixed intervals and also to replace individual bulbs as they fail in service. If the cost of group replacement is 60 paise per bulb and the total number of bulbs are 1000. What is the best interval between group replacement.					14M	CO3	L3

End of Week	1	2	3	4	5	6	7	8
Pro. of failure to date	0.05	0.13	0.25	0.43	0.68	0.88	0.96	1.00

(OR)

6.	(a)	Explain the johnsons's procedure of n jobs through two machines.					7M	CO3	L2
	(b)	A manufacturing company processes 6 different jobs on two machines A and B number of units of each job and its processing time on A and B are given in the following table. Find the optimum sequence the total minimum elapsed time in minutes and ideal time for each machine.					7M	CO3	L3

Job	A	B	C	D	E	F
M/C A	5	16	6	3	9	6
M/C B	8	7	11	5	7	14

UNIT – IV

7.	(a)	Explain the types of queuing models.	7M	CO4	L2
	(b)	In railway marshalling yard goods trains arrive at a rate of 30 trains per day. Assuming that the interval time follows an exponential distribution and the service time distribution is also exponential with an average of 36 min. calculate (i) Expected queuing size (Line length) and (ii) Probability that the queue size exceeds 10.	7M	CO4	L3

(OR)

8.	(a)	Explain advantages and disadvantages poisons arrivals.	7M	CO4	L2
	(b)	Explain the advantages and disadvantages of simulation of maintenance problems.	7M	CO4	L2

UNIT-V

9.	(a)	Explain the Economic Order quantity.	7M	CO5	L2
	(b)	Differentiate between P system and Q system.	7M	CO5	L2

(OR)

10.	(a)	Explain the sequential stochastic programming.	7M	CO5	L2
	(b)	Explain the Instantaneous demand model in stochastic programming.	7M	CO5	L2

Q.P. Code: 1803604 | SET - 2

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

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

SUB: Power Plant 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)	Explain the different types of circuits used in steam power plants with a neat sketch.	7M	CO1	L2
	(b)	Draw the general layout of ash handling and explain any one ash handling system (equipment) with a sketch.	7M	CO1	L2
		(OR)			
2.	(a)	With a neat sketch explain the coal handling system.	7M	CO1	L2
	(b)	Explain the working of belt conveyor with their relative merits and demerits.	7M	CO1	L2
		UNIT – II			
3.	(a)	Draw the Diesel power plant layout with auxiliaries and explain the fuel supply system.	7M	CO2	L2
	(b)	What is meant by supercharging and mention the advantages?	7M	CO2	L2
		(OR)			
4.	(a)	List the advantages of a combined cycle power plant	7M	CO2	L1
	(b)	With a sketch, explain the working principle of a open cycle gas turbine.	7M	CO2	L2
		UNIT – III			
5.	(a)	What is the hydrological cycle? Explain its significance in locating the site.	7M	CO3	L2
	(b)	Explain the pumped storage plant with a neat sketch.	7M	CO3	L2
		(OR)			
6.	(a)	Draw the layout of a nuclear power plant and explain its working.	7M	CO3	L2
	(b)	With a neat sketch explain the working principle of a fast breeder reactor.	7M	CO3	L2
		UNIT – IV			
7.	(a)	Explain the working of a flat plate collector.	7M	CO4	L2
	(b)	Draw a neat diagram of a Horizontal axis wind turbine and explain its main components.	7M	CO4	L2
		(OR)			
8.	(a)	Describe the working of a fuel cell.	7M	CO4	L2
	(b)	Write advantages, limitations and applications of MHD System	7M	CO4	L2
		UNIT-V			
9.	(a)	Define connected load, Maximum demand and demand factor	7M	CO5	L2
	(b)	A peak load on the thermal power plant is 75 MW. The loads having maximum demands of 35 MW, 20 MW, 15 MW and 18 MW are connected to the power plant. The capacity of the plant is 90 MW and the annual load factor is 0.53. Calculate the average load on a power plant, energy supplied per year, demand factor and diversity factor.	7M	CO5	L3
		(OR)			
10.	(a)	Explain in detail, the cost analysis of power stations.	7M	CO5	L2
	(b)	Explain pollutants and pollution standards applicable to power plants.	7M	CO5	L2

Q.P. Code: 1803605

SET - 2

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

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

SUB: Gas Turbine and Jet Propulsion (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)	Differentiate clearly between a closed cycle gas turbine and an open cycle gas turbine?	7M	CO1	L2
	(b)	List the methods of improving the efficiency of a simple gas turbine?	7M	CO1	L1
		(OR)			
2.	(a)	Compare the thermal efficiency of gas turbine with & without a regenerator?	7M	CO1	L3
	(b)	Describe the difference between an ideal gas turbine plant and an actual gas turbine plant?	7M	CO1	L2
		UNIT – II			
3.	(a)	Classify jet propulsion engines and distinguish between atmospheric jet engines and rockets?	7M	CO2	L2
	(b)	Derive the expression for thermal efficiency of a jet propulsion system?	7M	CO2	L2
		(OR)			
4.	(a)	Explain the necessity of thermal jet engines and list its applications?	7M	CO2	L2
	(b)	State the two laws on which propulsion of a vehicle through a fluid medium is based?	7M	CO2	L1
		UNIT – III			
5.	(a)	Explain the working of a turbo jet with schematic diagram indicating various components & with the help of P-V and T -S diagram?	7M	CO3	L2
	(b)	Define overall efficiency of turbojet engine and state how it is related to its thermal and propulsive efficiencies?	7M	CO3	L1
		(OR)			
	(a)	What is the role of a diffuser in turbo jet engine?	7M	CO3	L1
	(b)	Enumerate the relative advantages and disadvantages among turbojet, turbofan and turboprop engines?	7M	CO3	L1
		UNIT – IV			
7.	(a)	State the operating principle of ram jet engine?	7M	CO4	L1
	(b)	Explain the working of pulse jet engine with neat diagram?	7M	CO4	L2
		(OR)			
8.	(a)	What are the advantages and disadvantages of ram jet engines?	7M	CO4	L1
	(b)	Draw schematic diagram of a pulsejet engine and label all components?	7M	CO4	L3
		UNIT-V			
9.	(a)	Explain the classification of rockets?	7M	CO5	L2
	(b)	Explain the working principle of liquid propellant rocket engine with a diagram?	7M	CO5	L2
		(OR)			
10.	(a)	What are the requirements of an ideal rocket propellant?	7M	CO5	L1
	(b)	What are the advantages and disadvantages of Solid propellant rocket engine ?	7M	CO5	L1

Q.P. Code: 1804603

SET - 2

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

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

SUB: Microwave Engineering (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)	Derive the field components for TM waves in a rectangular waveguide.	7M	CO1	L4
	(b)	Explain the operation of Magic tee and derive its S-matrix	7M	CO4	L4
		(OR)			
2.	(a)	Derive the field components for TE waves in a circular waveguide.	7M	CO1	L4
	(b)	With a neat sketch, explain the operation of Circulator.	7M	CO1	L2
		UNIT – II			
3.	(a)	Explain the construction and working of two cavity klystron amplifier.	7M	CO2	L2
	(b)	Compare O-type and M-type tubes.	7M	CO2	L4
		(OR)			
4.	(a)	What are the limitations of conventional tubes at microwave frequencies? Explain how these limitations can be overcome.	7M	CO2	L2
	(b)	Derive the bunching parameter of Reflex Klystron Oscillator.	7M	CO2	L4
		UNIT – III			
5.	(a)	Explain the construction and working of helix TWT.	7M	CO2	L2
	(b)	Explain the modes of resonance and PI mode operation.	7M	CO2	L2
		(OR)			
6.	(a)	Explain the suppression of oscillations in TWT.	7M	CO2	L2
	(b)	Derive Hull Cut-off Voltage equation for cylindrical magnetron.	7M	CO2	L4
		UNIT – IV			
7.	(a)	Explain different modes of operation of Gunn diode.	7M	CO5	L2
	(b)	Explain in detail about the parametric amplifier. Mention its applications	7M	CO5	L2
		(OR)			
8.	(a)	Explain the construction and working of Tunnel diode.	7M	CO5	L2
	(b)	Explain the construction and operation of Varactor diode.	7M	CO5	L2
		UNIT-V			
9.	(a)	Explain in detail about unknown impedance measurements using necessary experimental setup?	7M	CO3	L2
	(b)	Explain various technologies involved in the fabrication of Microwave integrated circuits.	7M	CO3	L2
		(OR)			
10.	(a)	With neat block diagram, explain Bolometer method for power measurement.	7M	CO3	L2
	(b)	Explain the advantages, disadvantages and applications of MICs.	7M	CO3	L2

Q.P. Code: 1804604

SET - 2

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

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

SUB: Fiber Optic Communications (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 a block diagram of fiber optic communication system and describe the function of each component?	7M	CO1	L6
	(b)	A step index fiber has the normalized frequency of 26.6 at 1300 nm. If the core radius is 25 m, find the numerical aperture?	7M	CO1	L1
		(OR)			
2.	(a)	What is V number and Write the refractive index expression for step index fiber.	7M	CO1	L1
	(b)	For a fiber with core refractive index of 1.54 and fractional refractive index difference of 0.01. Calculate its numerical aperture?	7M	CO1	L5
		UNIT – II			
3.	(a)	Describe the Material Absorption Losses in Silica Glass Fibers?	7M	CO2	L4
	(b)	What are the differences between Active glass and Chalgenide glass?	7M	CO2	L1
		(OR)			
4.	(a)	Explain Plastic optical fibers and Mechanical Properties of Fibers?	7M	CO2	L2
	(b)	Explain the Fiber Birefringence and Polarization Mode Dispersion?	7M	CO2	L2
		UNIT – III			
5.	(a)	Discuss the principle of operation of LASER diodes with a neat diagram.	7M	CO3	L6
	(b)	Explain the Physical principles of Avalanche photo diode (APD)?	7M	CO3	L2
		(OR)			
6.	(a)	Explain the principal of LASER diode. What are the pumping techniques of LASER diode?	7M	CO3	L2
	(b)	Draw and compare the construction and characteristics of PIN and avalanche photo diode.	7M	CO3	L6
		UNIT – IV			
7.	(a)	Explain the source to fiber power launching and source output pattern?	7M	CO4	L2
	(b)	What are the different types of Connectors and Explain Single mode fiber connectors?	7M	CO4	L1
		(OR)			
8.	(a)	Explain the optical power coupling with neat diagram?	7M	CO4	L2
	(b)	Discuss Laser diode to fiber coupling and LED coupling to single mode fibers?	7M	CO4	L6
		UNIT-V			
9.	(a)	What are the different types of error sources and explain Digital signal transmission?	7M	CO5	L1
	(b)	Explain in detail about the Operational principles of WDM ?	7M	CO5	L2
		(OR)			
10.	(a)	Discuss about the Optical Time domain Reflectometer (OTDR)?	7M	CO5	L6
	(b)	Discuss about the Attenuation Measurements and dispersion Measurements?	7M	CO5	L6

Q.P. Code: 1805601

SET - 2

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

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

SUB: Internet of Things (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)	Explain briefly about IoT Protocols.	7M	CO1	L1
	(b)	Explain IoT Communication Models.	7M	CO1	L1
		(OR)			
2.		Explain in detail about IoT levels and Deployment Templates.	14M	CO1	L1
		UNIT – II			
3.		Determine the various communication models that can be used for Traffic monitoring system. Explain the IoT applications used for Retail domain.	14M	CO2	L1
		(OR)			
4.	(a)	Write about IoT applications on Home Automation in Smart Cities domain	7M	CO2	L4
	(b)	List and explain IoT applications used for Agriculture domain.	7M	CO2	L1
		UNIT – III			
5.	(a)	What are the differences and similarities between IoT and M2M.	7M	CO3	L1
	(b)	Write about Network Function Virtualization (NFV).	7M	CO3	L1
		(OR)			
6.		Explain IoT Design Methodology in detail.	14M	CO3	L1
		UNIT – IV			
7.		Outline the description on Arduino board and mention its specifications and individual components	14M	CO4	L1
		(OR)			
8.	(a)	Discuss the programming language of Arduino with an LED program Example	7M	CO4	L4
	(b)	Write a Python program to control the Soil moisture Sensor using Arduino	7M	CO4	L4
		UNIT-V			
9.		What is an IoT device? Explain basic building blocks of an IoT device.	14M	CO5	L1
		(OR)			
10.	(a)	Explain about Raspberry Pi board and installation of Linux on Raspberry Pi.	7M	CO5	L1
	(b)	Write a program to control Automatic Door Close/Open using Resberry PI	7M	CO5	L4

Q.P. Code: 1805602

SET - 2

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

B. Tech. VI Semester (R18UG) Supplementary Examinations of Jul;y – 2023

SUB: Data Mining (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)	What is the need for Data Mining? Explain.	7M	CO1	L2
	(b)	State and explain the different data used in Data Mining	7M	CO1	L3
		(OR)			
2.	(a)	Define Pattern. Explain how patterns can be identified in Data Mining	7M	CO1	L2
	(b)	Describe three challenges to data mining regarding data mining methodology and user interaction issues.	7M	CO1	L3
		UNIT – II			
3.	(a)	Explain why data preprocessing is important.	7M	CO2	L2
	(b)	What are the methods involved in Data Cleaning? Discuss	7M	CO2	L3
		(OR)			
4.	(a)	Discuss the methods to normalize data	7M	CO2	L2
	(b)	Elaborate on Data Discretization.	7M	CO2	L2
		UNIT – III			
5.	(a)	Describe the basic concepts of pattern mining	7M	CO3	L2
	(b)	Explain how Association Analysis to Correlation Analysis works.	7M	CO3	L3
		(OR)			
6.	(a)	Illustrate how to mine multilevel associations.	7M	CO3	L3
	(b)	Explain the following pruning pattern space and pruning data space.	7M	CO3	L2
		UNIT – IV			
7.	(a)	Discuss the general approach for classification.	7M	CO4	L2
	(b)	Explain rule-based classification	7M	CO4	L3
		(OR)			
8.	(a)	Elaborate the importance of accuracy and error measures.	7M	CO4	L3
	(b)	How to evaluate the accuracy of a classifier/ predictor? Explain.	7M	CO4	L2
		UNIT-V			
9.	(a)	Give an overview of clustering.	7M	CO5	L3
	(b)	Elaborate on grid based clustering method.	7M	CO5	L2
		(OR)			
10.	(a)	Discuss about outliers.	7M	CO5	L2
	(b)	Illustrate the detection of outlier using any one method.	7M	CO5	L3

Q.P. Code: 1805603 | SET - 2

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

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

SUB: Artificial Intelligence (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)	Discuss in detail about Greedy's Best First Search.	7M	CO1	L6
	(b)	Explain about A* Search with an example.	7M	CO1	L2
		(OR)			
2.	(a)	Explain in detail about Agent Architecture.	7M	CO1	L2
	(b)	Explain about BFS and DFS.	7M	CO1	L2
		UNIT – II			
3.	(a)	Explain in detail about First Order Logic with an example.	7M	CO2	L2
	(b)	Explain about Predicate Logic with an example.	7M	CO2	L2
		(OR)			
4.	(a)	Explain in detail about Knowledge based Agent.	7M	CO2	L2
	(b)	Elaborate the issues in Knowledge Representation.	7M	CO2	L2
		UNIT – III			
5.	(a)	Describe about Bayesian Network.	7M	CO3	L6
	(b)	Explain about Temporal Model.	7M	CO3	L2
		(OR)			
6.	(a)	Explain the Bayes Rule and its applications.	7M	CO3	L2
	(b)	Explain about Hidden Markov Model.	7M	CO3	L2
		UNIT – IV			
	(a)	Describe about Strong Slot Filler Structures.	7M	CO4	L6
	(b)	Explain about Frame Representation.	7M	CO4	L2
		(OR)			
8.	(a)	Describe about Weak Slot Filler Structures.	7M	CO4	L6
	(b)	Explain about Semantic Network Representation.	7M	CO4	L2
		UNIT-V			
9.	(a)	Explain about Tic Tac Toe Problem.	7M	CO5	L2
	(b)	Discuss about NLP.	7M	CO5	L6
		(OR)			
10.	(a)	Explain about 8 Queens Problem.	7M	CO5	L2
	(b)	Explain in detail about Partial Order Planning.	7M	CO5	L2

Q.P. Code: 1805608

SET - 2

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

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

SUB: Mobile Application Development (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)	Describe the commonly used attributes in TEXTVIEW control.	7M	CO1	L2
	(b)	Explain the procedure to launch android applications on a handset.	7M	CO1	L2
		(OR)			
	(a)	Explain briefly the Anatomy of Android Application.	7M	CO1	L1
	(b)	Describe the use of Android Debug Bridge in detail.	7M	CO1	L2
		UNIT – II			
3.	(a)	Explain the role and functionality of each component that make the android application when you create a new android project.	7M	CO2	L2
	(b)	Develop an android application to collect various programming languages known by students using checkbox control.	7M	CO2	L3
		(OR)			
4.		Illustrate the life cycle of an activity with a neat diagram.	14M	CO2	L2
		UNIT – III			
5.	(a)	Explain in detail about linear layout with suitable example.	7M	CO3	L2
	(b)	Develop an android application for creating Audio Player application.	7M	CO3	L3
		(OR)			
6.	(a)	Explain in detail about the Drawable Resources.	7M	CO3	L2
	(b)	Develop an android application to display copying progress with progress bar.	7M	CO3	L3
		UNIT – IV			
7.	(a)	Describe the two most common ways of debugging an application in detail.	7M	CO4	L2
	(b)	Discuss about creating fragments with java code.	7M	CO4	L2
		(OR)			
8.		Explain the Spinner control and write a program to populate the spinner list using and array adapter.	14M	CO4	L3
		UNIT-V			
9.	(a)	Explain about creating options menu through XML.	7M	CO5	L2
	(b)	Discuss briefly about replacing a menu with the actionbar.	7M	CO5	L2
		(OR)			
10.	(a)	Describe the process of creating submenus.	7M	CO5	L2
	(b)	Explain about accessing databases with the ADB.	7M	CO5	L2

Q.P. Code: 18OE501

SET - 2

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

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

SUB: Data Structures (OE)

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)	What is Singly linked list? Show how deletion and traversing takes place in single linked list	10M	CO1	L1
	(b)	Define DS and write the types of DS.	4M	CO1	L1
		(OR)			
	(a)	Explain about Doubly linked list and its operations.	10M	CO1	L2
	(b)	Define Linear data structures and give examples	4M	CO1	L1
		UNIT – II			
3.	(a)	Define queues. How to implement the queues using arrays.	7M	CO2	L2
	(b)	Write about the operations of stack.	7M	CO2	L3
		(OR)			
4.	(a)	Explain how to implement queues using linked list.	10M	CO2	L2
	(b)	Write about any two applications of queues	4M	CO2	L3
		UNIT – III			
5.	(a)	Construct a BST with element. 45 40 30 60 25 50 80 15 70 10	7M	CO3	L6
	(b)	Define binary tree and its representation.	7M	CO3	L2
		(OR)			
6.	(a)	Explain about complete and full binary tree with examples.	7M	CO3	L2
	(b)	Explain about Leftist trees	7M	CO3	L2
		UNIT – IV			
7.	(a)	Explain about Red Black Tree with examples.	7M	CO4	L2
	(b)	Explain how imbalance is removed in red black trees	7M	CO4	L3
		(OR)			
8.	(a)	Write about breadth first search in a graph with example	7M	CO4	L3
	(b)	Explain the rotations in splay trees	7M	CO4	L3
		UNIT-V			
9.	(a)	Explain the procedure of selection sort.	7M	CO5	L2
	(b)	Sort the elements using bubble sort: 45 40 30 60 25 50	7M	CO5	L6
		(OR)			
10.	(a)	Compare linear search and binary search	7M	CO5	L3
	(b)	Sort the elements K S R M C O L L E G E using merge sort	7M	CO5	L6

Q.P. Code: 18OE502

SET - 2

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

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

SUB: Database Management Systems (OE)

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 Database.Architecture with a neat diagram.	7M	CO1	L2
	(b)	List out the various relational operations with their usage.	7M	CO1	L1
		(OR)			
2.	(a)	Construct an ER diagram for hospital with a set of patients and set of doctors, associated with each patient a log of various tests and examination conducted.	7M	CO1	L3
	(b)	What are the three different types of schemas? Illustrate with a neat diagram.	7M	CO1	L1
		UNIT – II			
3.	(a)	Write about Implicit and Explicit triggers.	7M	CO2	L1
	(b)	Explain in detail about Aggregate functions in DBMS with an example.	7M	CO2	L2
		(OR)			
4.	(a)	List and explain DDL and DML commands with its syntax	7M	CO2	L1
	(b)	Construct the SQL queries for the following: **(i)** Write a query to display the current date. **(ii)** For each employee, display the employee number, job, salary, and salary increased by 15% and expressed as a whole number. Label the column New Salary **(iii)** Write a query that displays the employee's names with the first letter capitalized and all other letters lowercase, and the length of the names, for all employees whose name starts with J, A, or M. Give each column an appropriate label. Sort the results by the employees' last names.	7M	CO2	L3
		UNIT – III			
5.	(a)	Explain 3NF and BCNF with an example.	7M	CO3	L4
	(b)	Illustrate with an example Lossless join Decomposition.	7M	CO3	L2
		(OR)			
6.	(a)	Compare 4NF and 5NF.	7M	CO3	L4
	(b)	What are the various steps involved in Schema refinement in Data base Design?	7M	CO3	L1
		UNIT – IV			
7.	(a)	Explain transaction properties with a suitable example for each.	7M	CO4	L5
	(b)	Outline in detail the transaction Isolation Levels.	7M	CO4	L2
		(OR)			
8.	(a)	Illustrate what are the fields of query processing.	7M	CO4	L2
	(b)	Determine the various transaction states in a simple transaction model.	7M	CO4	L5
		UNIT-V			
9.	(a)	Explain the differences between basic 2PL, strict 2PL, rigorous 2PL?	7M	CO5	L4
	(b)	What is a Deadlock? How can you handle it?	7M	CO5	L1
		(OR)			
10.	(a)	Classify Time Stamp - Based Concurrency Control protocols with an example?	7M	CO5	L4
	(b)	Summarize Multi-Version Schemes of Concurrency Control with example.	7M	CO5	L2

Q.P. Code: 18OE2601

SET - 2

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

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

SUB: Advanced Numerical Methods (OE)

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 a real root of the equation $xe^x - cosx = 0$ by using Newton–Raphson method.	7M	CO1	L1
	(b)	Solve $x^3 = 2x+5$ for a positive root by iteration method	7M	CO1	L3
		(OR)			
2.		Using Gauss-Seidel iteration method to solve the system 8x-3y+2z =20, 4x+11y-z =33, 6x+3y+12z =36	14M	CO1	L3
		UNIT – II			
		Consider the following data	14M	CO2	L1

X	20	23	26	29
f(x)	0.3420	0.3907	0.4384	0.4848

Find the value of y at x = 21 and x = 28

		(OR)			
4.	(a)	Derive Newton's forward interpolation formula.	7M	CO2	L3
	(b)	Use Lagrange's method find y(40)	7M	CO2	L3

X	30	35	45	55
Y	148	96	68	34

		UNIT – III			
5.		Derive Newton-Cote's Quadrature formula.	14M	CO3	L3
		(OR)			
6.	(a)	Find the value of $\int_0^{\frac{\pi}{2}} e^{\sin x}$ correct to four decimal places by Simpson's $\frac{3}{8}^{th}$ rule.	7M	CO3	L1
	(b)	Find the value of $\int_0^{\frac{\pi}{2}} \sin x dx$ by using Trapezoidal rule..	7M	CO3	L1
		UNIT – IV			
7.		Given $y' = 1-2xy$, $y(0) = 0$. Find y(0.2) and y(0.4) by using Taylor's series method.	14M	CO4	L1
		(OR)			
8.		Given $\frac{dy}{dx} = \frac{y-x}{y+x}$, y(0)=1. Find y(0.2) and y(0.4) by Runge-kutta method.	14M	CO4	L1
		UNIT-V			
9.		Solve $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$ in $0 \le x \le 4, 0 \le y \le 4$ given that $u(0,y) = 0$, $u(4,y) = 4+y$, $u(x,0) = 3x^2$, $u(x,4) = \frac{x^2}{3}$ with $\Delta x = \Delta y = 1$.	14M	CO5	L3
		(OR)			
10.		Determine the values of y at the pivotal points of the interval (0,1),if y satisfies the boundary value problem $y^{IV}+81y=81x^2$, $y(0)=y(1)=y^{11}(0)=Y^{11}(1)=0$. (Take n=3)	14M	CO5	L3

Q.P. Code: 18OE502

SET - 2

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

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

SUB: Database Management Systems (OE)

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 Database.Architecture with a neat diagram.	7M	CO1	L2
	(b)	List out the various relational operations with their usage.	7M	CO1	L1
		(OR)			
2.	(a)	Construct an ER diagram for hospital with a set of patients and set of doctors, associated with each patient a log of various tests and examination conducted.	7M	CO1	L3
	(b)	What are the three different types of schemas? Illustrate with a neat diagram.	7M	CO1	L1
		UNIT – II			
3.	(a)	Write about Implicit and Explicit triggers.	7M	CO2	L1
	(b)	Explain in detail about Aggregate functions in DBMS with an example.	7M	CO2	L2
		(OR)			
4.	(a)	List and explain DDL and DML commands with its syntax	7M	CO2	L1
	(b)	Construct the SQL queries for the following: **(i)** Write a query to display the current date. **(ii)** For each employee, display the employee number, job, salary, and salary increased by 15% and expressed as a whole number. Label the column New Salary **(iii)** Write a query that displays the employee's names with the first letter capitalized and all other letters lowercase, and the length of the names, for all employees whose name starts with J, A, or M. Give each column an appropriate label. Sort the results by the employees' last names.	7M	CO2	L3
		UNIT – III			
5.	(a)	Explain 3NF and BCNF with an example.	7M	CO3	L4
	(b)	Illustrate with an example Lossless join Decomposition.	7M	CO3	L2
		(OR)			
6.	(a)	Compare 4NF and 5NF.	7M	CO3	L4
	(b)	What are the various steps involved in Schema refinement in Data base Design?	7M	CO3	L1
		UNIT – IV			
7.	(a)	Explain transaction properties with a suitable example for each.	7M	CO4	L5
	(b)	Outline in detail the transaction Isolation Levels.	7M	CO4	L2
		(OR)			
8.	(a)	Illustrate what are the fields of query processing.	7M	CO4	L2
	(b)	Determine the various transaction states in a simple transaction model.	7M	CO4	L5
		UNIT-V			
9.	(a)	Explain the differences between basic 2PL, strict 2PL, rigorous 2PL?	7M	CO5	L4
	(b)	What is a Deadlock? How can you handle it?	7M	CO5	L1
		(OR)			
10.	(a)	Classify Time Stamp - Based Concurrency Control protocols with an example?	7M	CO5	L4
	(b)	Summarize Multi-Version Schemes of Concurrency Control with example.	7M	CO5	L2