Q.P. Code: 256412 **SET - 2**

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

B. Tech. V Sem. (R15) Supplementary Examinations of May 2019

SUB: OPERATIONS RESEARCH (CE)

Time : 3 Hours Max. Marks: 70

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

UNIT – I

1. (a) Discuss the scope and applications of operations research in different sectors. 7M

   (b) A company is planning to determine its product mix out of three different products P_1, P_2 and P_3. The monthly sales of the product P_1 is limited to a maximum of 500 units. For every two units of P_2 produced, there will be one unit of by-product which can be sold at the rate of Rs.20 per unit. The highest monthly demand for this by-product is 200 units. The contributions per unit of the products P_1, P_2 and P_3 are Rs.50, Rs.70 and Rs. 60 respectively. The processing requirements of these products are as shown below. 7M

Process	Hours per unit			Available hours
	P_1	P_2	P_3	
I	3	5	2	1000
II	4	-	3	700
III	4	3	2	1300

   Formulate a LP model of this problem to find the optimum product mix such that the total contribution is maximized.

(OR)

2. (a) Define the following properties of linear programming solution. 4M
   (i) Feasible solution (ii) Infeasible solution
   (iii) Alternate Optimal solution (iv) Degenerate solution

   (b) Using simplex algorithm to Maximize $Z = 3X_1 + 5X_2$ 10M
   Subject to $3X_1 + 2X_2 \le 18$, $0 \le X_1 \le 4$, $0 \le X_2 \le 6$.

UNIT – II

3. (a) Form the dual of the following primal problem. Minimize $Z = 2X_1 + 6X_2$ 4M
   Subject to: $9X_1 + 3X_2 \ge 20$, $2X_1 + 7X_2 = 40$, X_1 and $X_2 \ge 0$.

   (b) Solve the following LP problem using dual simplex method. 10M
   Maximize $Z = -3X_1 - X_2$
   Subject to: $X_1 + X_2 \ge 1$, $2X_1 + 3X_2 \ge 2$, X_1 and $X_2 \ge 0$.

(OR)

4. Consider the following LP problem. Maximize $Z = 6X_1 + 8X_2$ 14M
   Subject to: $5X_1 + 10X_2 \le 60$, $4X_1 + 4X_2 \le 40$, $X_1, X_2 \ge 0$.
   Check whether the addition of the constraint $7X_1 + 2X_2 \le 65$ affects the optimality. If it does, find the new optimum solution.

UNIT – III

5. Obtain the initial basic feasible solution to the following transportation problem using least cost method and Vogel's approximation method. 14M

	A	B	C	D	**Supply**
1	3	7	6	4	**5**
2	2	4	3	2	**2**
3	4	3	8	5	**3**
Demand	**3**	**3**	**2**	**2**	

(OR)

6. Five different jobs are to be assigned to five different operators such that the total processing time is minimized. The matrix entries represent processing times in hours. Solve the problem by applying Hungarian algorithm. 14M

Job	**Operator**				
↓	**1**	**2**	**3**	**4**	**5**
1	10	12	15	12	8
2	7	16	14	14	11
3	13	14	7	9	9
4	12	10	11	13	10
5	8	13	15	11	15

UNIT – IV

7. (a) Two jobs, each requiring different sequence and processing times are to be processed on 'm' machines. Find the minimum elapsed time to complete the jobs. 7M

Job 1	**Sequence**	**A**	**B**	**C**	**D**	**E**
	Time	3	4	2	6	2
Job 2	**Sequence**	**B**	**C**	**A**	**D**	**E**
	Time	5	4	3	2	6

(b) Given the processing times of the jobs on m/c 1 & m/c 2, find the optimum sequence (that minimizes the total elapsed time) of the jobs and the total elapsed time (make span), required to complete the jobs on the given machines in the given order (i) M_1, M_2. Also find idle times on each machine in each case**.** 7M

Job	**1**	**2**	**3**	**4**	**5**	**6**
m/c 1	5	2	13	10	8	12
m/c 2	4	3	14	1	9	11

(OR)

8. Solve the travelling salesman problem given by the following data: 14M
$C_{12} = 20$, $C_{13} = 4$, $C_{14} = 10$, $C_{23} = 5$, $C_{34} = 6$, $C_{25} = 10$, $C_{35} = 6$, $C_{45} = 20$, where $C_{ij} = C_{ji}$ and there is no route between cities i and j, if a value for C_{ij} is not shown.

UNIT-V

9. In a cargo loading problem, there are four items of different per unit weight and value, as given below. The maximum cargo load is restricted to 17 units. How many units of each item be loaded to maximize the value? 14M

Item, i	Weight / unit, w_i	Value / unit, v_i
1	1	1
2	3	5
3	4	7
4	6	11

(OR)

10. Alpha logistic company has to load a cargo out of four items whose details are shown below. The maximum weight of the cargo is 10 tons. Find the optimal cargo loading using dynamic programming method such that the total return is maximized. 14M

item, i	1	2	3
Weight, w_i / unit (in tons)	2	3	1
Return, r_i / unit (in rupees)	500	900	300

Q.P. Code: 256612 **SET - 2**

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

B. Tech. V Sem. (R15) Supplementary Examinations of May 2019

SUB: WATER SUPPLY ENGINEERING (CE)

Time : 3 Hours Max. Marks: 70

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

UNIT - I

1. (a) Discuss briefly the importance and necessity of water supply schemes. 7M
   (b) Write in brief the duties of environmental engineers. 7M

(OR)

2. (a) Describe the 'incremental method' by which the population of a locality on a futue date can be estimated. Also state its advantages over arithmetical and geometrical methods. 7M
   (b) For a city of population 1,00,000, find the following in connection with the water distribution system; (i) daily water demand, (ii) daily variation in water demand, (iii) Monthly variation in water demand, (iv) Hourly variation, (v) fire demand. 7M

UNIT – II

3. (a) What are the various classification of wells? Describe a dug-well with the help of a neat sketch. 7M
   (b) What are the common impurities mostly found in natural water? Explain their effect on the quality of water. 7M

(OR)

4. (a) What is meant by pH value? How it is determined? What is its importance in the water analysis? 7M
   (b) Write the standard for potable water for the following:- turbidity, pH, Hardness, fluorides, iron and manganese, B-coli index? 7M

UNIT – III

5. (a) Draw the layout plan of the purification works. 7M
   (b) A coagulation-sedimentation plant clarifies 40 MLD. The quantity of filter alum required at the plant is 18 mg/l. If the raw water is having an alkalinity equivalent to 5mg/lit of CaCO3, determine the quantity of filter and the quick lime (containing 85% of CaO) required per year by the plant. Given the molecular weights as: (Al=27, S=32, O=16, H=1, Ca=40, C=12). 7M

(OR)

6. (a) What are the different filter materials used in the filtration process? Explain the properties of filter materials. 7M
   (b) Draw a plan, cross-section and longitudinal section of a slow sand filter bed, with dimensions, noting the sizes and depths of filtering materials used. 7M

UNIT – IV

7. (a) What is zeolite? How is it regenerated? Explain the zeolite method of water softening. 7M
   (b) Describe various methods of removing excess fluorides from water. 7M

(OR)

8. (a) Explain the multistage flash evaporation method for desalination. 7M
   (b) Discuss various rain water harvesting methods. 7M

UNIT-V

9. (a) Discuss with the help of diagrams, various methods of laying out the distribution system. 7M
   (b) Draw a neat sketch of an over-head distribution reservoir showing the various fittings and connections, and explain the function it can serve in public water supply scheme. 7M

(OR)

10.	(a)	Briefly explain the methods used for detecting the leakage of water from the underground water mains.	7M
	(b)	Briefly discuss the design principles involved in the design of a water supply network to be laid in multi-storied residential building.	7M

Q.P. Code: 256812 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
SUB: CONCRETE TECHNOLOGY (CE)

Time : 3 Hours | Max. M: 70

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

UNIT - I

1.	(a)	What are the physical properties of ordinary Portland cement.	7M
	(b)	What is meant by an admixture in cement, classify the admixtures that are used in cement.	7M
		(OR)	
2.	(a)	What are the ingredients of ordinary Portland cement, what are their functions.	7M
	(b)	Write short note on low heat cement, under which circumstances it is effectively used.	7M

UNIT – II

3.	(a)	What is meant by alkali aggregate reaction in concrete, what is its effect.	7M
	(b)	What is meant by workability of concrete, what are the different factors that will affect the workability of concrete.	7M
		(OR)	
4.	(a)	What are the factors that promote the alkali aggregate reaction in concrete, how you will controle the alkali aggregate reaction in concrete.	7M
	(b)	What are the different methods that are adopted for compacting the fresh concrete.	7M

UNIT – III

5.	(a)	Define creep in concrete, what is the effect creep in structural members.	7M
	(b)	Define shrinkage in concrete, what are its different forms in concrete.	7M
		(OR)	
6.	(a)	What are the different methods that are used for controlling sulphate attack on concrete.	7M
	(b)	What are the different air entraining agents that used for making air entrained concrete. What are the factors that will affect the amount of air entrainment in concrete.	7M

UNIT – IV

7.	(a)	Explain about the accelerated curing test on concrete.	7M
	(b)	What are the different non destructive testing methods that are adopted to evaluate the strength of hardened concrete.	7M
		(OR)	
8.		Explain about the ultrasonic pulse velocity method to find the strength of hardened concrete.	14M

UNIT-V

9.	(a)	What is meant by the term mix design of concrete, what is its significance in making the concrete.	7M
	(b)	Explain about the various parameters that are to be considered in designing a durable concrete mix.	7M
		(OR)	
10.	(a)	What are the common terminologies used in the statistical quality control of concrete, briefly explain them.	7M
	(b)	Define the term high strength concrete, what are the different methods of making high strength concrete.	7M

Q.P. Code: 257012 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
SUB: HYDROLOGY (CE)

Time: 3 Hours | Max. Marks: 70

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

UNIT - I

1. (a) What is 'hydrologic cycle'? Describe with a neat sketch the hydrologic cycle. 7M
   (b) Describe the three methods of determining the average depth of rainfall over an area. 7M

(OR)

2. (a) Describe the principle of working of a float type recording rain gauge with a neat sketch. 7M
   (b) The average annual rainfalls of 5 rain gauges in a basin are 89, 54, 45, 41 and 55 cm. If the error in the estimation of basin mean rainfall should not exceed 10%, how many additional gauges should be installed in the basin? 7M

UNIT – II

3. (a) What is 'evaporation'? What factors affect evaporation? Discuss. 7M
   (b) What is evapotranspiration? Distinguish between the potential evapotranspiration and the actual evapotranspiration. What are the measures for evapotranspiration control? 7M

(OR)

4. (a) Define infiltration and infiltration capacity rate. Explain the working of a double ring infiltrometer with the help of a neat sketch. 7M
   (b) A 6 h storm produced rainfall intensities of 7, 18, 25, 12, 10 and 3 mm/h in successive one hour intervals over a basin of area 800 sq. km. The resulting runoff is observed to be 2640 hectare-metres. Determine the Φ-index for the basin. 7M

UNIT – III

5. (a) Distinguish between
   (i) Surface runoff and subsurface runoff
   (ii) Direct runoff and base flow
   (iii) Overload flow and interflow 7M
   (b) The direct runoff hydrograph resulting from a 5 cm effective rainfall of 6 h duration is given below. Determine the area of the catchment and the ordinates of the 6 h unit hydrograph.

Time (hours)	0	6	12	18	24	30	36	42	48	54	60	66	72
Direct runoff (m^3/s)	0	25	175	320	360	310	230	165	105	60	30	10	0

7M

(OR)

6. (a) Define unit hydrograph. What are the assumptions underlying the unit hydrograph theory? What are the limitations of unit hydrograph? 5M
   (b) The ordinates of 4 h U.H. of a basin of area 300 km^2 measured at 1 h intervals are 6, 36, 66, 91, 106, 93, 79, 68, 58, 49, 41, 34, 27, 23, 17, 13, 9, 6, 3 and 1.5 m^3/s respectively. Obtain the ordinates of 3 h U.H. for the basin using the S- curve technique. 9M

UNIT – IV

7. (a) Define 'design flood'. Describe the various methods of estimating design flood. What are their limitations? 10M

   (b) Explain the terms 'return period' and 'exceedence probability' 4M

(OR)

8. (a) What is flood routing? What are the uses of flood routing? Describe the Modified Puls method of reservoir routing. 7M

   (b) List the various methods of flood control. Explain any two methods of flood control. 7M

UNIT-V

9. (a) Distinguish between
   (i) Aquiclude and Aquitard,
   (ii) Specific yield and specific retention
   and (iii) Water table and piezometric surface. 7M

   (b) In a water table aquifer of 50 m thickness, a 20 cm diameter well is pumped at a uniform rate of 0.05 m^3/s. If the steady state drawdown measured in the observation wells located at 10 m and 100 m distances from the well are 6.5 m and 0.25 m respectively, determine the hydraulic conductivity of the aquifer. 7M

(OR)

10. (a) Derive an expression for the steady state discharge of well fully penetrating into a confined aquifer. 7M

    (b) In a recuperation test on an open well, the water level was depressed by 4 m and it was observed to rise by 2.5 m in 90 minutes. What is specific capacity of the well? What would be the yield from the well under a depression head of 3 m, if the diameter of the well is 7.5 m? 7M

Q.P. Code: 257212

SET - 2

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

B. Tech. V Sem. (R15) Supplementary Examinations of May 2019

SUB: GEOTECHNICAL ENGINEERING-II (CE)

Time : 3 Hours Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

UNIT - I

1. (a) Describe the wash boring method of soil exploration. What are its merits and demerits? 7 M

   (b) What is meant by bore hole log? Show a typical bore hole log? 7 M

(OR)

2. (a) Explain the seismic refraction method of soil exploration. 7 M

   (b) What do you understand about disturbed and undisturbed soil sample? Discuss the different terms applied to sampler to describe sample disturbance. 7 M

UNIT – II

3. (a) Derive an expression for active and passive earth pressures by Rankine's theory duly stating the assumptions. 7 M

   (b) A retaining wall 6 m high with a vertical back supports a saturated clay soil with horizontal surface. The properties of backfill are $\varphi = 0^o$, c = 35 kN/m^2 and γ_{sat} = 20 kN/m^3. Assume the back to be smooth and determine the total active earth pressure and its point of application if the cracks are formed. 7 M

(OR)

4. (a) Describe the Rebhann's graphical method of determination of active earth pressure in cohesionless soils. 7 M

   (b) A smooth vertical wall 8 m high retains a soil with $\varphi = 25^o$, c = 25 kN/m^2 and γ = 18 kN/m^3. The horizontal backfill surface carries a uniform surcharge load of 35 kN/m^2. Determine the total passive earth pressure if the wall moves towards the backfill. 7 M

UNIT – III

5. (a) Discuss the effect of ground water table on the bearing capacity of the soil. 6 M

   (b) Calculate the safe bearing capacity of a square footing 1.5 m x 1.5 m, located at a depth of 1 m below the ground level using I.S. code method. The soil has c = 30 kN/m^2 , $\varphi = 20^o$ and γ = 20 kN/m^3. Assume the water table is very deep. Take N_c = 17.7 , N_q = 7.4 , and N_γ = 5.0. 8M

(OR)

6. (a) What are the assumption made in the derivation of Terzaghi's bearing capacity theory? Writ the equation for ultimate bearing capacity of shallow foundation. 6 M

   (b) A circular footing of 2.5 m diameter carries a load of 2000 kN. Find the factor of safety against bearing capacity failure if the soil below the footing has following values: c = 5 kN/m^2 , $\varphi = 15^o$ and γ = 17.6 kN/m^3 and depth foundation is 1.5 m. Take N_c = 12.5 , N_q = 4.5 , and N_γ = 2.5. 8 M

UNIT – IV

7. (a) Explain the various dynamic formulae to determine the pile load carrying capacity. 6 M

   (b) A 9 pile group with pile diameter 40 cm and 120 cm centre to centre spacing both ways (symmetrically placed) is driven to a depth of 12 m through clay of unconfined compressive strength of 100 kN/m^2. Assume adhesion factor as 0.5, calculate the load that the group can carry with a factor of safety of 3.0. 8 M

(OR)

8. (a) Discuss the determination of settlement of pile groups in sand and clay. 8 M

(b) Design a circular pile to carry a load of 150 kN in saturated clay deposit with c = 80 kN/m^2 , $\varphi = 0^o$ and adhesion factor = 0.5. The diameter of the pile shall be 450 mm and there is no equipment for pile driving.

UNIT-V

9. (a) Explain the different types of slope failures. 7 M

(b) Determine the factor of safety with respect to cohesion for a submerged embankment 25 m high and having a slope 45^o. The soil properties are c = 40 kN/m^2 , γ_{sat} = 18 kN/m^3 and $\varphi = 10^o$. For $\varphi = 10^o$ and slope angle 45^o, the stability number is equal to 0.108. 7 M

(OR)

10. (a) Discuss the friction circle method for the stability analysis of slopes. 9 M

(b) Stability analysis by the method of slices for 1:1 slope on the critical slip gave the following results: Sum of tangential forces = 150 kN; Sum of normal forces = 320 kN; Sum of neutral forces = 50 kN; Length of failure surface = 18 m; Effective angle of shearing resistance = 15^o; Effective cohesion = 20 kN/m^2. Calculate the factor of safety with respect to shear strength. 5 M

Q.P. Code: 257412 **SET - 2**

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

B. Tech. V Sem. (R15) Supplementary Examinations of May 2019

SUB: MECHANICS OF MATERIALS - II (CE)

Time : 3 Hours Max. Marks: 70

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

UNIT - I

1. At a point in a material subjected to two dimensional stress, one of the principal stresses is 120 MN/m^2, tensile on a plane at 60^0 to this principal plane, the normal stress is zero. Determine (14M)
   (i) The other principal stress
   (ii) The shear stress on the plane of zero normal stress and
   (iii)The planes on which the normal shear are equal in magnitude.

(OR)

2. (a) A piece of material is subjected to two perpendicular tensile stresses of 300 Mpa and 150 Mpa. Determine the normal and shear stress components on the plane the normal of which makes an angle of 40^0 with the 300 Mpa stress. Also find the resultant. (7M)
   (b) What is Mohr stress circle? How is it useful in the solution of stress analysis problems? (7M)

UNIT – II

3. (a) A wall thickness of a cylindrical shell of 600mm internal diameter and 4m long is 12mm. If the shell is subjected to an internal pressure of 1.2 MPa .Find the following: (10M)
   (i) The maximum intensity of shear stress induced
   (ii) The change in dimensions of the shell
   Take E=205 Gpa and poisons ratio as 0.3.
   (b) A spherical shell of 1.8m internal diameter and 8mm thickness is filled with water under pressure until the volume is increased by 250 x 10^3 mm^3. Find the pressure exerted by water on the shell take E=200 Gpa and poisons ratio as 0.3. (4M)

(OR)

4. A Compound cylinder is formed by shrinking one tube to another the inside and outside diameters of the outer tube being 100mm and 150mm respectively and of the inner tube 80mm and 140mm respectively. After shrinking the radial pressure at the common surface is 45Mpa. If the cylinder is subjected to an internal pressure of 60Mpa .Determine the final stress set up with various radial surface of the cylinder. What is the resultant radial pressure at the common surface? (14M)

UNIT – III

5. (a) A straight bar of mild steel column 3 m long and 14mmx8mm in section is mounted in strut testing machine and loaded axially till it buckles. Assuming Euler's formula for pinned ends to apply and estimate the maximum central deflection before the material attains its yield point of 250 N/mm^2. Take E = 2x10^5 N/mm^2. (7M)
   (b) A bar of length 4 m when used as a simply supported beam and subjected to a UDL of 25 kN/m over the whole span deflects 20 mm at the centre. Determine the crippling loads when it is used as a column with the following conditions: (i) Both ends pin pointed, (ii) One end fixed and the other hinged, (iii) Both ends fixed. (7M)

(OR)

6.	(a)	Derive from fundamentals, the expression for Euler's crippling load for a strut fixed at both ends.	7M
	(b)	A cylindrical column 180 mm external diameter, 120 mm internal diameter and 10 m long are hinged at both ends. Calculate the (i) Euler's Crippling load (ii) Crippling load as given by Rankin's formula. E=100 GPa , σ_c=550 MPa and Rankin's constant α=1/1600.	7M

UNIT – IV

7.	(a)	Sketch the core of a rectangular section and a circular section with salient values.	4M
	(b)	Determine the stress at all corners of a rectangular cross section 1400 mm* 700 mm due to a 240 kN compressive load acting at an eccentricity 80 mm with respect to both centroidal axes of the cross section in the first quadrant.	10M

(OR)

8.	(a)	A square chimney 50 m high has a flue opening of size 2.5 m x 2.5 m. Find the minimum width required at the base for no tension if the masonry weighs 30 kN/m^3 and the wind pressure is 1.5kN/m^2. The permissible stress in the masonry is 1 N/mm^2.	7M
	(b)	A masonry retaining wall has a trapezoidal section 2.5m wide at the top, 6m wide at the base, and is 8m high. The earth face is vertical and the angle of repose of the retained material is 30^o. If the masonry weighs 21 kN/m^3 and the earth has a density of 20 kN/$m^{3,}$ find the stress intensities at the base.	7M

UNIT-V

9.		Find the centroidal principal moments of inertia of an unequal 'L' angle section 80*60*8mm.	14M

(OR)

10.		A 80mmx 60mm x 8mm angle is used as a cantilever with a 50mm leg horizontal on the top .The length of the cantilever is 500mm.Determine the position of the neutral axis and the maximum stress developed if a load of 2.5 kN is applied at the free end .Assume the centre line of the load to pass through the shear centre.	14M

Q.P. Code: 356412 **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
SUB: SIGNALS AND SYSTEMS (EEE)

Time : 3 Hours Max. Marks: 70

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

UNIT - I

1. Define Fourier series and derive the relationship between trigonometric Fourier series and exponential Fourier series. 14M

(OR)

2. Explain signal approximation using orthogonal functions, minimizing the mean square error. 14M

UNIT – II

3. Obtain the Fourier transform of the following signals: 14M
   i. x(t) = δ(t)
   ii. $x(t) = e^{-t}u(t)$
   iii. Unit step signal.
   iV. Signum function.

(OR)

4. Determine the Fourier transforms of two sided exponential signal. 14M

UNIT – III

5. What is Impulse Response? Show that the Response of an LTI system is convolution Integral of its impulse Response with input signal? 14M

(OR)

6. Test the stability of the LTI systems given below 14M
   (i) $h(t) = e^{-5t}$ t (ii) $h(t) = e^{-4t}u(t)$ (iii) $h(t) = t\cos t$ (iv) $h(t) = te^{-3t}u(t)$

UNIT – IV

7. (a) Derive the relation between Bandwidth and Rise time. 7M
   (b) What is aliasing? Explain its effect on sampling. 7M

(OR)

8. State and prove the following properties of DTFT. 14M
   (i) Time shifting
   (ii) Convolution in time
   (iii) Linearity
   (iv) Differentiation in frequency

UNIT-V

9. (a) State and prove initial value and final value theorems of Laplace transform. 7M
   (b) List the advantages and Limitations of Laplace transform. 7M

(OR)

10. Define Z-Transforms and state the properties of ROC of Z-Transforms. 14M

Q.P. Code: 356612 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
SUB: ELECTRICAL MACHINES-III (EEE)

Time : 3 Hours | Max. Marks: 70

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

UNIT - I

1.	(a)	What is armature reaction? Explain the effect of armature reaction on the terminal voltage of an alternator.	7M
	(b)	A 4 KVA, 3 phase, 110V, 50Hz, star connected alternator has Xd = 3 ohm and Xq = 2 ohm. The machine is delivering full load current of 0.8 p.f lagging at rated voltage. Find the induced emf, load angle and maximum power output of the alternator.	7M
		(OR)	
2.	(a)	Explain the sources of harmonics? what are the various effects of harmonics on generated emf in an alternator?	7M
	(b)	Describe the procedural steps to find regulation of an alternator using ZPF method?	7M

UNIT – II

3.	(a)	Explain the procedural to find out X_d and X_q of sailent pole machine through an experiment?	7M
	(b)	In a 50 KVA , star connected, 440 V, 3 phase, 50 Hz alternator, the effective armature resistance is 0.25 ohm per phase. The synchronous reactance is 3.2 ohm per phase and leakage reactance is 0.5 ohm per phase. Determine at rated load and unity power factor. (a) Internal e.m.f. Ea, (b) no-load e.m.f. Eo , (c) percentage regulation on full – load (d) value of synchronous reactance which replaces armature reaction	7M
		(OR)	
4.	(a)	Explain the Power angle characteristics of a synchronous generator	6M
	(b)	Explain the following concepts in detail (i) Synchronizing Power (ii)Torque of the synchronous generator	8M

UNIT – III

5.	(a)	State the conditions necessary for paralleling alternators. Explain one dark and two bright lamp method with necessary electrical circuit diagram.	8M
	(b)	Two Ac generators running in parallel supplying a lighting load of 2000kw and a motor load of 4000kw at 0.8pf lagging. One machine is loaded to 2400kw at 0.95pf lagging. What is the output and power factor of the second machine.	6M
		(OR)	
6.	(a)	Discuss the load shearing between two alternators	7M
	(b)	What is an infinite bus? State the characteristics of an infinite bus. What are the operating characteristics of an alternator connected to an infinite bus?	7M

UNIT – IV

7.	(a)	Describe in brief the principle of operation of synchronous motor	7M
	(b)	Draw and discuss the phasor diagrams of a 3-phase synchronous motor for lagging, leading and unity power factor conditions.	7M
		(OR)	
8.	(a)	Explain an experimental method of determining of 'V' curves for a synchronous motor.	8M
	(b)	Write the short notes on (a) Hunting (b) Damper bars	6M

UNIT-V

9.	(a)	Discuss in detail about the split-phase motors	7M
	(b)	Describe the phase control of 1-phase induction motor	7M
		(OR)	
10.	(a)	Show that the starting torque of a single phase-phase induction motor is zero	7M
	(b)	Explain the operation of variable reluctance motor.	7M

Q.P. Code: 356812 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
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.

UNIT – I

1. State and derive the condition for maximum power transfer on a short line. 14M

(OR)

2. (a) What is Ferranti effect? Draw the phasor diagram when this effect occurs on a transmission line. 5M

   (b) A three-phase, 50 Hz, 400-kV line is 500 km long. The line impedance is 0.93 mH/km and its capacitance is 0.012 μF/km per phase. For a lossless line, determine (1) the surge impedance Zc, phase current β, velocity of propagation *v*, and the line wavelength λ. (2) The receiving end is supplying a rated load of 750 MW at 0.8 power factor(lag) at 400 kV. Determine the sending end quantities and the voltage regulation. 9M

UNIT – II

3. (a) What are the advantages and disadvantages of per unit representation? 4M

   (b) The one-line diagram of an unloaded power system is shown in Fig.1. Reactances of the two sections of transmission line are shown on the diagram. The generators and transformers are rated as follows: 10M

   Generator 1: 20 MVA, 13.8 kV, X" =0.20 p.u.
   Generator 2: 30 MVA, 1 kV, X" =0.20 p.u
   Generator 3: 30 MVA, 20 kV, X" =0.20 p.u.
   Transformer T_1: 25 MVA, 220/13.8 kV(Y/Δ), X=10%.
   Transformer T_2: Single-phase units each rated 10 MVA, 127/18 kV, X= 10%.
   Transformer T_3: 35 MVA, 220/22 kV (Y/Y), X=10%.
   Draw the impedance diagram with all reactances marked in per unit and with letters to indicate points corresponding to the one-line diagram. Choose a base of 50MVA, 13.2 kV in the circuit of generator 1.

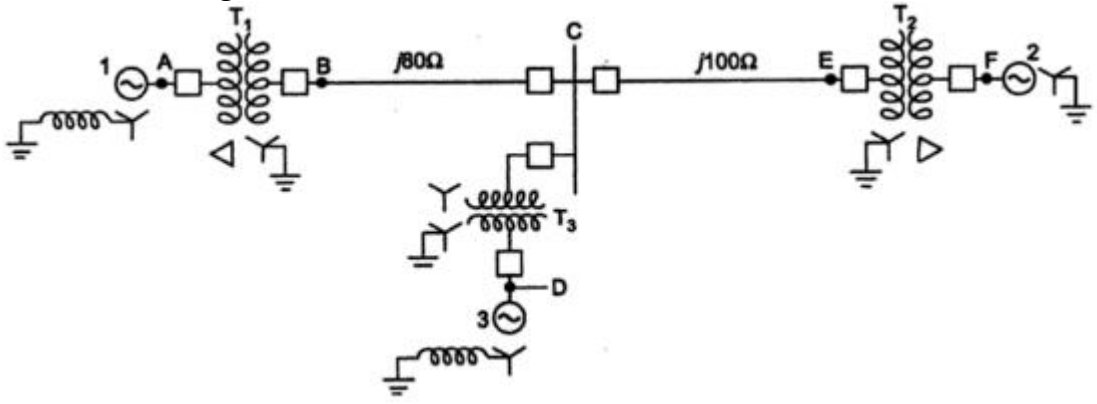


Fig.1

(OR)

4. Consider the 50 Hz power system the single-line diagram of which is shown in Fig. 2. The system contains three generators, three transformers and three transmission lines. The system ratings are 14M

Generator G_1	200 MVA, 20 kV, X_d = 15%
Generator G_2	300 MVA, 18 kV, X_d = 20%
Generator G_3	300 MVA, 20 kV, X_d = 20%
Transformer T_1	300 MVA, 220Y/22 kV, X_d = 10%
Transformer T_2	Three single-phase units each rated 100 MVA, 130Y/25 kV, X = 10%
Transformer T_3	300 MVA, 220/22 kV, X = 10%

The transmission line reactances are as indicated in the figure. We have to draw the reactance diagram choosing the Generator 3 circuit as the base.

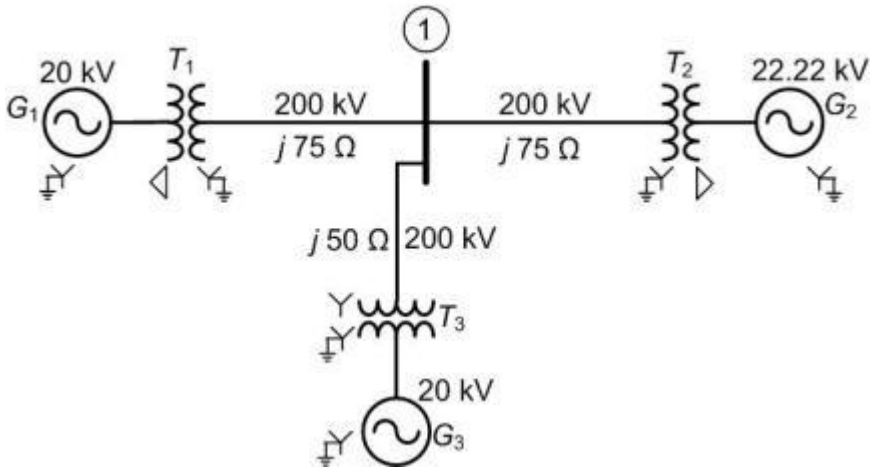


Fig. 2

UNIT – III

5. (a) What are different symmetrical faults and compare their properties? 6M

(b) Consider the power system of Fig. 3 in which a synchronous generator supplies a synchronous motor. The motor is operating at rated voltage and rated MVA while drawing a load current at a power factor of 0.9 (lagging) when a three phase symmetrical short circuit occurs at its terminals. Calculate the fault current that flow from both the generator and the motor. 8M

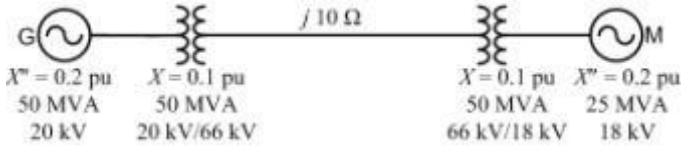


Fig.3

(OR)

6. (a) Draw the zero sequence network for the system shown in Fig. 4. Assume the zero sequence reactances for the generator and motors of 0.06 per unit. Current limiting reactors of 2.5 ohms each are connected in the neutral of the generator and motor No.2 . the zero sequence reactance of the transmission line is 300 ohms. 8M

Fig. 4

(b) Explain various methods of connecting current limiting series reactor. 6M

UNIT – IV

7. (a) What are symmetrical components? Why are they used in power system fault analysis? Explain in detail. 9M

(b) Explain the need for short circuit studies in power system. 5M

(OR)

8. Derive the expression for the fault current and the terminal voltages of a 3-phase alternator, when there is a double line to ground fault occurs at the terminals of Alternator Assume generator neutral is solidly earthed. 14M
   (a) Neglect fault impedance Z_{fault}
   (b) Consider fault impedance Z_{fault}

UNIT-V

9. (a) What is soil resistance and discuss in brief the factors that influence its value? 6M

(b) Determine the value of reactance to be connected in the neutral connection to neutralize the capacitance current of a overhead line to ground capacitance of each line equal to 0015 µF. The frequency is 50 Hz. 8M

(OR)

10. Write Short notes on 14M
   (i) Voltage transformer earthing
   (ii) Earthing transformer

Q.P. Code: 357012 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
SUB: POWER ELECTRONICS (EEE)

Time : 3 Hours | Max. Marks: 70

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

UNIT – I

1. (a) Explain the Dynamic turn on and turn off characteristics of SCR in detail? 8M
   (b) Design the snubber circuit parameters with neat sketch. 6M

(OR)

2. (a) Explain in detail about turn on and turn off mechanism of SCR? 8M
   (b) Explain complimentary commutation in detail? 6M

UNIT – II

3. (a) Explain the operation of a single – phase half Controlled bridge rectifier feeding R-L load. Plot the output voltage and current waveforms for conduction mode and derive an expression for the D.C output voltage. 8M
   (b) A single phase fully controlled thyristor bridge converter supplies a load consisting of R, L and Vc. The inductance L in the circuit is so large that the output current may be considered to be virtually constant. Assume the SCR to be ideal with following data: RMS supply voltage =220V, load resistance =0.5Ω, output current i_{dc}=10A. 6M

(OR)

4. Explain the operation of a 3-Φ Half controlled bridge converter with R-L load. Derive an expression for its average output voltage and RMS output voltage. (Assume current to be continuous) 14M

UNIT – III

5. (a) Explain how TRIAC is used to regulate the output voltage feeding R-load. Plot the output voltage and current waveforms. Also, derive the expression for the R.M.S value of output voltage. 8M
   (b) Explain the operation of single-phase step-down bridge type cyclo converter with RL load with relevant output voltage and current wave forms. 6M

(OR)

6. (a) Explain the operation of 1-Φ A.C voltage controller with R-L load. Derive the expression for the R.M.S value of output voltage. 8M
   (b) Explain the operation of single-phase step-up bridge type cyclo converters with R load whose output frequency is four times the supply frequency. Plot the relevant output voltage and current wave forms. 6M

UNIT – IV

7. (a) Explain the operating principle of Basic chopper. Derive an expression for its average output voltage. 8M
   (b) Explain the various control strategies employed for control of output voltage of chopper. 8M

(OR)

8. (a) What is multiphase chopper? Explain the operating modes of the multiphase chopper in detail. 8M
   (b) Explain in detail the working of the Buck converter in detail. 8M

UNIT-V

9. (a) Discuss the principle of working of a single-phase bridge inverter with output voltage and current waveforms. 8M
   (b) Explain the space vector modulation technique for harmonic minimization. 6M

(OR)

10. (a) Discuss briefly the voltage control technique in single phase inverters. 8M
    (b) Explain the operation of modified McMurray bridge inverter.

Q.P. Code: 357212 | **SET - 2**

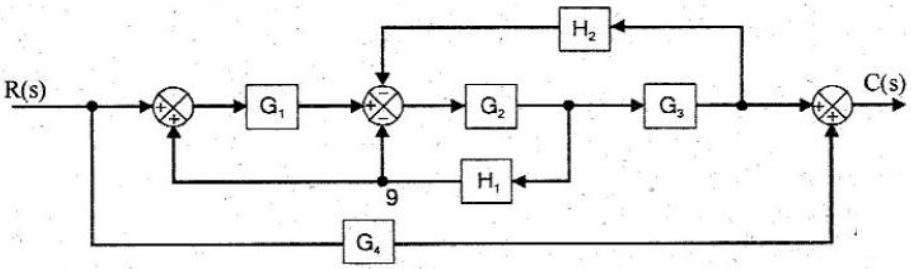
K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
SUB: CONTROL SYSTEMS (EEE)

Time : 3 Hours | Max. Marks: 70

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

UNIT - I

1. (a) Convert the block diagram to signal flow graph and determine the transfer function using Mason's gain formula 10M

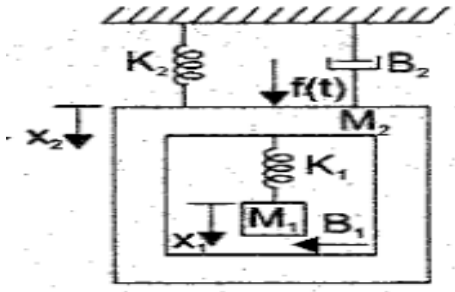


(b) Explain closed loop system with an example. 4M

(OR)

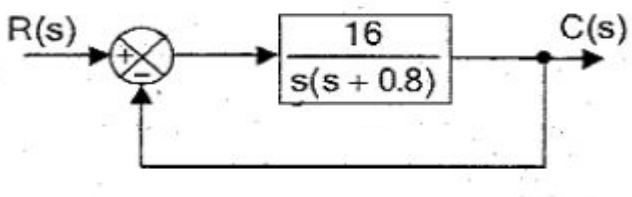
2. (a) Derive an expression for the Transfer function of an armature controlled D.C. Servomotor. 6M

(b) Write the differential equations governing the mechanical system shown below. Draw the force-voltage and force-current electrical analogous circuits and verify by writing mesh and node equations. 8M



UNIT – II

3. A positional control system with vecity feed back is shown in below fig. what is the response C(t) to the unit step input. Given that ζ=0.5.Also calculate the raise time, peak time, maximum overshoot and settling time. 14M



(OR)

4. (a) Explain the effect PD controller on time response characteristics. 8M

(b) Derive an expression for the time response of first order system when subjected to unit-Step input. 6M

UNIT – III

5. (a) Sketch Root locus for the unity feedback system whose open loop transfer function 10M

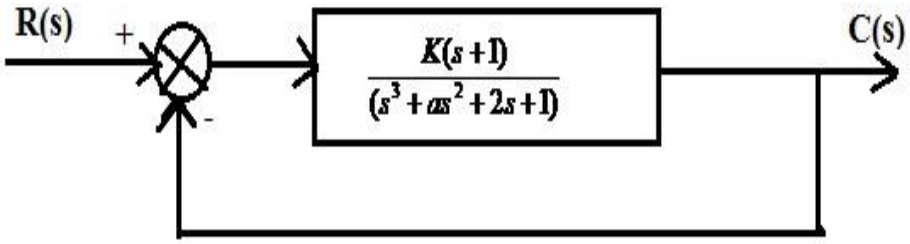
$$G(s)H(s)=\frac{K}{s(s+2)(s+4)}$$

(b) Discuss the effect of addition of Poles and Zeros to the open loop transfer function. 4M

(OR)

6. (a) Determine the location of S-plane of a system whose characteristic equation is $S^7+5S^6+9S^5+4S^3+20S^2+36S+36=0$ and also comment on system stability. 7M

(b) A system oscillates with frequency ω if it has poles at $S=\pm j\omega$ and no poles in the right-half of the s-plane. Determine the value of 'K' and 'a' so that the system shown in Figure below oscillates at a frequency of 2 rad/sec. 7M



UNIT – IV

7. (a) Sketch the Nyquist plot and comment on the stability of the closed-loop system whose open-loop transfer function is 8M

$$G(s)H(s)=\frac{5}{(1-s)s}$$

(b) Write a short notes on (i) Phase margin (ii)Gain corner frequency. 6M

(OR)

8. For the transfer function $G(s)H(s)=\frac{5(1+2S)}{(1+4S)(1+0.25s)}$ 14M

Draw the Bode plot and determine the Phase margin and Gain margin

UNIT-V

9. Derive the transfer function of a Lag compensator 14M

(OR)

10. Design a Lead compensator for a unity feedback system with an open-loop transfer function $G(s)=\frac{K}{s(s+1)}$. For the specifications of K_v=10 Sec^{-1} and Phase margin=35^0. 14M

Q.P. Code: 357412 | **SET - 2**

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

B. Tech. V Sem. (R15) Supplementary Examinations of May 2019

SUB: MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS (EEE)

Time : 3 Hours | Max. Marks: 70

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

UNIT - I

1. What is Managerial Economics? Explain its focus area? 14M

(OR)

2. (a) Explain Law of demand? Are there any exceptions to this law? 7M
   (b) Discuss various determinants of demand. 7M

UNIT – II

3. (a) Explain Cobb – Douglas Production function 7M
   (b) Explain in brief the Law of Return to Scale 7M

(OR)

4. Define Break Even Analysis (BEA),State the advantages and limitations of BEA? 14M

UNIT – III

5. Compare and contrast between Perfect competition and Monopoly? 14M

(OR)

6. What is Pricing? Explain the methods of pricing 14M

UNIT – IV

7. Define Joint Stock Company and explain features of Joint Stock Company . 14M

(OR)

8. What do you mean by Working Capital and what factors determine the Working Capital Management? 14M

UNIT-V

9. (a) What is an Account? State the classification of Accounts. 7M
   (b) Prepare a Trial balance for the following accounts 7M

Capital	Rs.30,000	Cash in Hand	Rs. 15,500
Purchases	Rs. 8,000	Sales	Rs. 8,000
Furniture	Rs. 12,000	Creditors	Rs. 4,000
Bills Payable	Rs. 3,000	Salaries	Rs. 3,500
Debitors	Rs.5,000	Printing Exp	Rs. 1,000

(OR)

10. Explain various types of Liquidity Ratios with examples. 14M

Q.P. Code: 456412 **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
SUB: DIGITAL IC APPLICATIONS (ECE)

Time : 3 Hours Max. Marks: 70

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

UNIT - I

1.	(a)	Draw the CMOS three input NOR gate circuit diagram and explain using function table	7M
	(b)	Explain the ROM internal structure in detail.	7M
		(OR)	
2.	(a)	Draw the circuit diagram of two input LS-TTL NAND.	6M
	(b)	Explain the static RAM timing in terms of read operation and write operation in detail.	8M

UNIT – II

3.	(a)	Explain steps in HDL based design flow.	7M
	(b)	Write down the syntax of VHDL entity declaration and define each keyword in the syntax of VHDL entity.	7M
		(OR)	
4.	(a)	Explain in detail about structural design elements in VHDL.	7M
	(b)	Write the structural VHDL program for prime number detector.	7M

UNIT – III

5.	(a)	Draw the 74×139 dual 2 to 4 decoder circuit diagram and draw the traditional logic symbol of 74×139	7M
	(b)	Write the VHDL program for four 8-bit three state drivers.	7M
		(OR)	
6.	(a)	Draw the neat logic diagram of 74×151 and explain with help of truth table.	7M
	(b)	Write behavioral VHDL program for a nine input parity checker.	7M

UNIT – IV

7.	(a)	Write the VHDL code for 16-bit barrel shifter for left circular shift only.	7M
	(b)	Write alternative VHDL architecture for fixed point to floating point.	7M
		(OR)	
8.	(a)	Write behavioral VHDL architecture of 32 bit mode dependent comparator.	7M
	(b)	Write VHDL program for left shift fix ups.	7M

UNIT-V

9.	(a)	Draw and explain the logic diagram for positive edge triggered D flip flop with preset and clear	7M
	(b)	Write the VHDL program for a 74×163-like 4-bit binary counter.	7M
		(OR)	
10.	(a)	Draw the logic diagram for 74×194 four bit universal shift register.	8M
	(b)	Explain about synchronous system structure.	6M

Q.P. Code: 456612 **SET - 2**

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

B. Tech. V Sem. (R15) Supplementary Examinations of May 2019

SUB: COMPUTER ORGANIZATION (ECE)

Time : 3 Hours Max. Marks: 70

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

UNIT - I

1.	(a)	Explain block diagram of a digital computer with neat sketch?	7M
	(b)	Define a bus? Explain different types of bus structures used to interconnect Functional units in the computer system?	7M
		(OR)	
2.	(a)	Explain how will you measure the performance of a computer?	7M
	(b)	Explain Arithmetic micro operations?	7M

UNIT – II

3	(a)	Define Interrupt? Explain different types of interrupts?	7M
	(b)	Explain memory- reference instructions?	7M
		(OR)	
4.	(a)	Draw and explain the micro-programmed control unit?	10M
	(b)	What is an Instruction? Explain its functionalities?	4M

UNIT – III

5.		Write in detail about various addressing modes?	14M
		(OR)	
6.		What is a Pipelining? Describe in detail about different types pipeline processing?	14M

UNIT – IV

7.	(a)	Explain Input-Output Processor and Serial Communication?	7M
	(b)	Explain Different types of input/output Devices?	7M
		(OR)	
8.		Explain with the block diagram the DMA transfer in a computer System?	14M

UNIT-V

9.	(a)	Why you are using virtual memory? Explain	7M
	(b)	Explain different type of memories?	7M
		(OR)	
10.	(a)	Discuss about Cache Coherence, Shared Memory Multiprocessors?	7M
	(b)	Explain Inter Processor Arbitration and Inter Processor Communication (IPC)?	7M

Q.P. Code: 456812 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
SUB: ANTENNA AND WAVE PROPAGATION (ECE)

Time : 3 Hours Max. Marks: 70

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

UNIT - I

1. (a) Starting from the first principle Obtain the expression for the power radiated by a half wave dipole.
   (b) A transmitting antenna with an effective height of 100 meters has a current at the base 100 Amperes(rms) at the frequency of 300kHz.Find(i) The field strength at a distance of 10km and (ii) The power radiated.

(OR)

2. (a) What is meant by induction field and radiation field? Show that the directivity is directly proportional to the antenna effective aperture Ae.
   (b) Derive the field radiated from Quarter wave monopole antenna.

UNIT – II

3. (a) Explain the principle of operation of linear array antenna. What are its advantages?
   (b) What is binomial array ? Draw the pattern of 10 element binomial array with spacing between the elements of $3\lambda/4$ and $\lambda/2$.

(OR)

4. (a) Describe the principles of End-fire and Broad –side arrays.
   (b) A linear array of 4 isotropic elements spaced $\lambda/2$ apart and with equal currents fedin-phase plot the radiation pattern in polar coordinates.

UNIT – III

5. (a) Describe horn antenna. How is this antenna fed and what are its applications?
   (b) While measuring gain of a horn antenna the gain oscillator was set for 9.00 GHz frequency and the attenuation inserted was found to be 9.8db.Calculate the gain of the horn. The distance between the two horn was 35cm.

(OR)

6. (a) Discuss the principle of operation and considerations which have to be gone into the design construction of parabolic reflector antenna.
   (b) Determine gain ,beamdwidth and capture area for para bolic antenna with 10m diameter dish and dipole feed at 10GHz.

UNIT – IV

7. (a) Explain the wave tilt of surface waves.
   (b) How earth surface reflects radio waves?

(OR)

8. (a) Describe any two types of fading normally encountered in radio wave propagation. How are the problems of fading over come?
   (b) Determine the change in the electron density of E- layer when the critical frequency changes from 4MHz to 1 MHz between mid-day and sun-set.

UNIT-V

9. (a) What is ionosphere? Derive an expression for refractive index

   (b) Explain with help of suitable sketch, the concept of skip distance and its relation to maximum usable frequency.

(OR)

10. With reference to sky waves , explain the following:

    i. Virtual height
    ii. Critical frequency
    iii. Skip distance
    iv. Maximum usable frequency

Q.P. Code: 457012 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
SUB: DIGITAL COMMUNICATIONS (ECE)

Time : 3 Hours | Max. Marks: 70

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

UNIT - I

1.	(a)	With neat diagram explain the adaptive Delta modulation and demodulation system in Detail.	7M
	(b)	Draw and explain the basic elements of a PCM system	7M
		(OR)	
2.	(a)	Explain the working of TDM system with a neat sketch	7M
	(b)	What is companding? Sketch the characteristics of a compander.	7M
		UNIT – II	
3.	(a)	State and prove Nyquist first criterion for Zero ISI.	7M
	(b)	Explain the operation of the baseband digital transmission system	7M
		(OR)	
4.	(a)	Differentiate between binary versus M-ary	7M
	(b)	Explain modified duobinary signaling scheme with the help of diagram	7M
		UNIT – III	
5.	(a)	Explain the tradeoff between bandwidth and signal to noise ratio.	7M
	(b)	Explain the mutual information and its properties.	7M
		(OR)	
6.	(a)	State and prove Shannon Hartley theorem.	7M
	(b)	Explain the Huffman coding in detail along with example.	7M
		UNIT – IV	
7.	(a)	Describe how the errors are corrected using Hamming code with an example	7M
	(b)	What are the different methods of describing the structure of a convolutional code?	7M
		(OR)	
8.	(a)	Briefly describe about the Code tree, Trellis and State Diagram for a Convolution Encoder.	7M
	(b)	Explain matrix description of linear block codes	7M
		UNIT-V	
9.	(a)	Compare the performance of various digital modulation schemes	7M
	(b)	Explain the working principles of QPSK modulation and demodulation.	7M
		(OR)	
10.	(a)	Explain the principle of QPSK system. Compare binary PSK and QPSK schemes	7M
	(b)	Explain about coherent binary PSK transmitter and receiver.	7M

Q.P. Code: 457212 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
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.

UNIT - I

1.	(a)	Explain the concept of differential amplifier transfer characteristics.	5(M)
	(b)	Explain voltage gain of dual-input and balanced output differential amplifier.	9(M)
		(OR)	
2.	(a)	List & Explain the functions of an op -amp basic building blocks.	7(M)
	(b)	Explain briefly AC characteristics of an op – amp.	7(M)

UNIT – II

3.	(a)	With neat circuit & wave forms explain op-amp clipper circuit.	7(M)
	(b)	Explain V to I & I to V converters using op-amp.	7(M)
		(OR)	
4.	(a)	With neat schematic, explain sample & hold circuit operation and indicate its uses.	7(M)
	(b)	Explain Precision full wave rectifier using op-amp with neat schematic.	7(M)

UNIT – III

5.	(a)	What is an op-amp comparator? Explain the operation of window detector using op-amp?	7(M)
	(b)	With neat circuit diagram explain the operation of Schmitt trigger circuit using op-amp along with design procedure.	7(M)
		(OR)	
6.	(a)	Design second order Butterworth low pass filter having upper cut-off frequency 1Khz. Then determine its frequency response.	7(M)
	(b)	With neat schematic, explain op-amp second order high pass filter with design steps.	7(M)

UNIT – IV

7.	(a)	Draw the pin diagram and internal schematic of IC 555, explain its operation.	7(M)
	(b)	Explain the operation of 555 timer in monostable mode with neat schematic and necessary equations.	7(M)
		(OR)	
8.	(a)	Briefly discuss any two applications of phase locked loop (PLL).	6(M)
	(b)	With a neat schematic, Explain principle and operation of PLL. Also define i)Lock-in-range ii) Capture range iii) Pull time	8(M)

UNIT-V

9.	(a)	Briefly discuss about classification of DAC's on the basis of their outputs.	7(M)
	(b)	Explain the working of R – 2R ladder DAC and derive the expression for output voltage.	7(M)
		(OR)	
10.	(a)	Explain analog to digital conversion procedure using successive approximation method.	7(M)
	(b)	Explain the operation of Dual slope ADC with suitable diagram.	7(M)

Q.P. Code: 457412 | **SET - 2**

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

B. Tech. V Sem. (R15) Supplementary Examinations of May 2019

SUB: MICROPROCESSORS AND INTERFACING (ECE)

Time : 3 Hours | Max. Marks: 70

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

UNIT - I

1.	(a)	Explain the signals of Timing and Control Unit of 8085?	8M
	(b)	Write a program to multiply two numbers by repeated addition method?	6M
		(OR)	
2.	(a)	Draw the Timing diagram of MOV A,M instruction	8M
	(b)	Explain hardware and software interrupts of 8085.	6M

UNIT – II

3.	(a)	Compare 8085 with 8086 microprocessors with respect to architecture?	6M
	(b)	Explain the indirect addressing modes of 8086 with examples	8M
		(OR)	
4.	(a)	Explain minimum mode signals and the significance of Minimum Mode	6M
	(b)	Explain the following instructions of 8086 i) DAS ii) CMP iii) AAM iv)AAD	8M

UNIT – III

5.	(a)	Write an ALP to generate ten numbers of Fibonacii Series	8M
	(b)	Write an ALP to unpack a bcd number.	6M
		(OR)	
6.	(a)	Write an ALP to search for a character in a given string	8M
	(b)	Write an ALP to convert lower case character to upper case character.	6M

UNIT – IV

7.	(a)	Compare Interrupt and DMA data transfer Techniques.	6M
	(b)	Explain Mode 1 and Mode 2 operations of 8255.	8M
		(OR)	
8.	(a)	What are the applications of 8254? Explain modes of operations with waveforms.	8M
	(b)	Draw the block diagram of 8257 DMA controller and explain internal registers.	6M

UNIT-V

9.	(a)	Write ALP to generate triangular wave from a DAC interfaced to 8086 processor.	8M
	(b)	Interface 32K ROM to 8086 processor with 16 bit data bus.	6M
		(OR)	
10.	(a)	Discuss the block diagram of a Temperature measurement and control system using 8086 microprocessor	8M
	(b)	Draw the interfacing diagram of a switch connected to 8086 through 8255 PPI.	6M

Q.P. Code: 556412 **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
SUB: INDUSTRIAL MANAGEMENT (ME)

Time : 3 Hours Max. Marks: 70

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

UNIT - I

1. (a) Explain various analytical methods for plant location.
   (b) Explain product and process layout with applications.

(OR)

2. Explain various materials handling equipment used in a steel factory.

UNIT – II

3. (a) What are the objectives of conducting work study?
   (b) What are the process chart symbols used in method study?

(OR)

4. (a) Explain Therbligs used in micro motion study.
   (b) Explain cycle graph and chrono cycle graph

UNIT – III

5. (a) Explain time study procedure.
   (b) Sixty samples of an electronic operation revealed an average time of 3.20 minutes per unit. The performance rating was estimated at 105 percent, and allowances are set at 20 percent of the work time available. What is the standard time in minutes per piece?

(OR)

6. (a) Explain the procedure of work sampling.
   (b) What are the advantages and limitations of work sampling.

UNIT – IV

7. A project consists of nine activities whose time estimates (in weeks) and other characteristics are given below.

Activity	Preceding activities	Time estimates (weeks)		
		Optimistic	Most likely	Pessimistic
A	-	2	4	6
B	-	6	6	6
C	-	6	12	24
D	A	2	5	8
E	A	11	14	23
F	B,D	8	10	12
G	B,D	3	6	9
H	C,F	9	15	27
I	E	4	10	16

(i) Draw the PERT network for the project
(ii) What are the critical activities
(iii) What is the expected project completion time and its variance.
(iv) What is the probability of completing the project one week before the expected time.

(OR)

8. The following data relate to a project

Activity	Activity time(Days)		Activity cost(Rs.)	
	Regular	Crash	Regular	Crash
1-2	7	6	700	750
1-3	8	6	650	750
2-4	9	7	800	900
2-5	11	8	1600	1800
3-5	8	5	750	1000
3-6	10	7	1900	2100
4-7	12	10	1200	1300
5-7	13	11	1300	1400
6-7	14	10	1500	1800

(a) Draw the network , find the critical path and the duration of the project (the minimum as well as regular).

(b) If the project manager wants to reduce the completion time to 25 days, which activities would be required to be crashed and by how much? What shall be the cost involved.

(c) Can this project be completed in 22 days? What will be the cost involved

UNIT-V

9. (a) What is Inspection? Explain types of inspection.

(b) What are variable control charts? Explain construction of variable control charts.

(OR)

10. (a) What is an tribute? Explain fraction defective chart construction.

(b) The following table gives the number of missing rivets noted in newly fabricated buses. Construct the C-Chart

Bus Number	1	2	3	4	5	6	7	8	9	10
Rivets(C)	14	13	26	20	9	25	15	11	14	13

Q.P. Code: 556612

SET - 2

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

B. Tech. V Sem. (R15) Supplementary Examinations of May 2019

SUB: THERMAL ENGINEERING - II (ME)

Time : 3 Hours Max. Marks: 70

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

UNIT - I

1. (a) Compare between Carnot cycle and Rankine cycle 4M
   (b) In a steam power plant the condition of steam at inlet to the steam turbine is 20 bar and 300^0C and the condenser pressure is 0.1 bar. Two feed water heaters operate at optimum temperature. Determine: (i) the quality of steam at turbine exhaust, (ii) net work per kg of steam, (iii) Cycle efficiency and (iv) the steam rate. Neglect pump work. 10M

(OR)

2. (a) What is reheating? What the advantages are of reheat rankine cycle? 4M
   (b) The steam is supplied to a turbine at a pressure of 32 bar and a temperature of 410^0C. The steam then expands isentropically to a pressure of 0.08 bar. Find the dryness fraction of steam at the end of expansion and thermal efficiency of the cycle. If the steam is reheated at 5.5 bar to a temperature of 395^0C and then expands isentropically to 0.08 bar, what will be the dryness fraction and thermal efficiency of the cycle? 10M

UNIT – II

3. (a) Explain with a neat sketch the working principle of a locomotive boiler. 7M
   (b) Discuss in brief with their function (i) Fusible plug (ii) Man hole. 7M

(OR)

4. (a) How do you classify boilers? Explain the various methods producing draughts. 7M
   (b) A thermal power plant has a chimney draught of 3.5 cm of water column. The flue-gas temperature flowing through the chimney is 280^0C and ambient temperature is 15^0C. The amount of air supplied per kg of fuel is 20 kg. Calculate the height of the chimney. 7M

UNIT – III

5. In a nozzle, steam expands from 12 bar and 300^0C to 6 bar with flow rate of 5 kg/s. Determine throat and exit area if exit velocity is 500 m/s and velocity at inlet to nozzle is negligible. Also find coefficient of velocity at exit. Coefficient of velocity is the ratio of actual velocity of fluid at nozzle exit to the velocity at exit considering isentropic flow through nozzle. 14M

(OR)

6. (a) Steam is expanded in a set of nozzles from 10 bar and 200^0C to 5 bar. What type of nozzle is it? Neglecting the initial velocity find minimum area of the nozzle required to allow a flow of 3 kg/s under the given conditions. Assume that expansion of steam to be isentropic. 7M
   (b) Air enters a convergent nozzle from a reservoir at 2200kPa and 100^0C. If the exit area is 3.25 cm^2, what is the maximum mass flow rate that this nozzle can handle? Assume the process to be isentropic and that the air behaves as an ideal gas. 7M

UNIT – IV

7. (a) What is a steam turbine? State differences between impulse turbine and reaction turbine 6M

   (b) At the nozzle exit of the certain stage in a steam turbine, absolute velocity is 300 m/s. Rotor speed is 150 m/s and the nozzle angle is 18^0. The sum of rotor blade inlet angle and rotor outlet blade angle is 176.5^0. Assume the relative velocity at inlet and exit of the rotor are same, determine for a steam flow rate of 8.5 kg/s, the relative exit angle of the blade and the power output from the stage. 8M

(OR)

8. (a) Explain the principle of compounding of a steam turbine using a suitable neat sketch. 6M

   (b) A 50% reaction turbine running at 400 rpm has the exit angle of the blades as 20^0C and the velocity of steam relative to the blades at the exit is 1.35 times the mean speed of the blade. The steam flow rate is 8.33 kg/s and at a particular stage the specific volume is 1.381 m^3/kg. Calculate for this stage (i) a suitable blade height, assuming the rotor mean diameter 12 times the blade height and (ii) the diagram work. 8M

UNIT-V

9. (a) How jet condensers are classified? Explain about any one of them with the help of a neat sketch. 8M

   (b) Define vacuum efficiency and condenser efficiency. 6M

(OR)

10. (a) Discuss any two methods for obtaining maximum vacuum in a condenser. 6M

    (b) The outlet and inlet temperatures of cooling water to a condenser are 37.5^0C and 30^0C respectively. If the vacuum in the barometer is 706 mm of mercury with barometer reading 760 mm determine condenser efficiency. 8M

Q.P. Code: 556812 | **SET - 2**

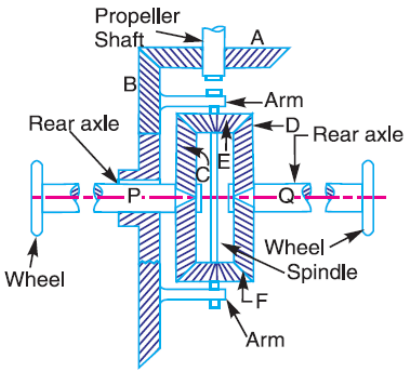
K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
SUB: DYNAMICS OF MACHINERY-I (ME)

Time : 3 Hours | Max. Marks: 70

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

UNIT – I

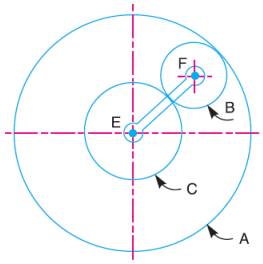
1. The figure shows a differential gear used in a motor car. The pinion A on the propeller shaft has 12 teeth and gears with the crown gear B which has 60 teeth. The shafts P and Q form the rear axles to which the road wheels are attached. If the propeller shaft rotates at 1000 r.p.m. and the road wheel attached to axle Q has a speed of 210 r.p.m. while taking a turn, find the speed of road wheel attached to axle P. **14M**



(OR)

2. (a) What do you understand by 'gear train'? Discuss the various types of gear trains. **5M**

   (b) An epicyclic gear consists of three gears A, B and C as shown in Fig. The gear A has 72 internal teeth and gear C has 32 external teeth. The gear B meshes with both A and C and is carried on an arm EF which rotates about the centre of A at 18 r.p.m.. If the gear A is fixed, determine the speed of gears B and C. **9M**



UNIT – II

3. In an open belt drive, the linear velocity of the belt is 3m/s. The angle of lap on the smaller pulley is 166^0, the coefficient of friction is 0.3 and the power transmitted is 3kW. Determine the effect of power transmission in the following cases: **14M**
   i). Initial tension in the belt is increased by 10%.
   ii). Angle of lap is increased by 10% by the use of an idler pulley, for the same speed and the tension on tight side.

(OR)

4. A shaft running at 500rpm carries a pulley 100cm diameter, which is driven by another pulley in the same direction with a speed reduction of 2:1 by means of ropes. The drive transmits 187kW. Angle of groove is 40^0. The distance between pulley centres is 200cm. The coefficient of friction between the rope and pulley is 0.2. The mass of the rope is 0.12kg/m length and has a safe allowable stress of $175N/cm^2$. It is recommended that initial tension in the rope should not exceed 800N. Find the number of ropes required and rope diameter. **14M**

UNIT – III

5. A band brake acts on the $3/4^{th}$ of circumference of a drum of 450mm diameter which is keyed to the shaft. The band brake provides a braking torque of 225N-m. One end of the band is attached to a fulcrum pin of the lever and the other end to a pin 100mm from the fulcrum. If the operating force is applied at 500mm from the fulcrum and the coefficient of friction is 0.25, find the operating force when the drum rotates in the i). clockwise direction, and ii). Counter clockwise direction. 14M

(OR)

6. Describe the construction and operation of a prony brake dynamometer and explain with detail the calculations involved in finding the power transmitted. 14M

UNIT – IV

7. The turning moment curve for an engine is represented by the equation $T=2000+950\sin 2\theta-570\cos 2\theta$ kg-m where θ is the angle turned by the crank from inner dead centre. If the resisting torque is constant, find: 14M
i). Power developed by the engine.
ii). Moment of inertia of flywheel in kg-m^2, if total fluctuation of speed is not to exceed 1% of mean speed which is 180rpm.

(OR)

8. A multi-cylinder engine is to run at a speed of 600 r.p.m. On drawing the turning moment diagram to a scale of 1 mm = 250 N-m and 1 mm = 3°, the areas above and below the mean torque line in mm^2 are: +160, –172, +168, -191, +197, –162. 14M
The speed is to be kept within ± 1% of the mean speed of the engine. Calculate the necessary moment of inertia of the flywheel. Determine the suitable dimensions of a rectangular flywheel rim if the breadth is twice its thickness. The density of the cast iron is 7250 kg/m^3 and its hoop stress is 6MPa. Assume that the rim contributes 92% of the flywheel effect.

UNIT-V

9. Derive an expression for height of a Proell gorvernor. 14M

(OR)

10. In a spring loaded governor of the Hartnell type, the mass of each ball is 1kg, length of vertical arm of the bell crank lever is 100 mm and that of the horizontal arm is 50 mm. The distance of fulcrum of each bell crank lever is 80 mm from the axis of rotation of the governor. The extreme radii of rotation of the balls are 75 mm and 112.5 mm. The maximum equilibrium speed is 5 per cent greater than the minimum equilibrium speed which is 360 r.p.m. Find, neglecting obliquity of arms, initial compression of the spring and equilibrium speed corresponding to the radius of rotation of 100 mm. 14M

Q.P. Code: 557012 **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
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.

UNIT – I

1.	(a)	What is meant by tool signature? Describe the tool signature of single point cutting tool.	6M
	(b)	Derive an expression for chip thickness ratio? Explain different types chips in metal cutting.	8M
		(OR)	
2.	(a)	Explain the factors affecting tool life?	8M
	(b)	What is under cut? Why it is provided?	6M

UNIT – II

3.	(a)	Explain the importance of slotting machine in a machine shop ?	6M
	(b)	Explain working of Shaper with neat sketch	8M
		(OR)	
4.	(a)	What are characteristics of cutting fluids?	7M
	(b)	Machining time calculation of a shaper?	7M

UNIT – III

5.		Describe Work holding devices of drilling machine with neat sketches?	14M
		(OR)	
6.		Explain the jig boring machine with a neat sketch?	14M

UNIT – IV

7.	(a)	Explain Vertical Milling machine with a neat sketch ?	8M
	(b)	What is hand milling machine? Explain its uses ?	6M
		(OR)	
8.		What are the planar type milling machine? Explain their features?	14M

UNIT-V

9.	(a)	With a neat sketch explain the principal parts of a Tool and Cutter Grinder?	10M
	(b)	State the merits and demerits of honing process?	4M
		(OR)	
10.		How are broaches classified ? Explain with a neat sketch the working principle of horizontal continuous broaching machine ?	14M

Q.P. Code: 557212

SET - 2

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

B. Tech. V Sem. (R15) Supplementary Examinations of May 2019

SUB: DESIGN OF MACHINE ELEMENTS-I (ME)

Time : 3 Hours Max. Marks: 70

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

UNIT - I

1. (a) Explain the general consideration in design process? 7M
   (b) A propeller shaft for a launch transmits 75 KW at 150 rpm and is subjected to a maximum bending moment of 1KN-m and an axial thrust of 70 KN. Find the shaft diameter based on maximum shear stress if the shear strength of the shaft material is limited to 100 MPa? 7M

(OR)

2. (a) A shaft is transmitting 100 kW at 160 rpm. Find a suitable diameter for the shaft, if the maximum torque transmitted exceeds the mean by 25%. Take maximum allowable shear stress as 70 MPa? 4M
   (b) A bolt is subjected to an axial pull of 9 kN together with a transverse shear force of 4.5 kN. Elastic limit in tension is 225 MPa, factor of safety is 3. 10M
      i. Determine the maximum and minimum principal stresses?
      ii. Diameter of the bolt using maximum shear stress theory?

UNIT – II

3. (a) Explain design of shafts based on torsional rigidity? 5M

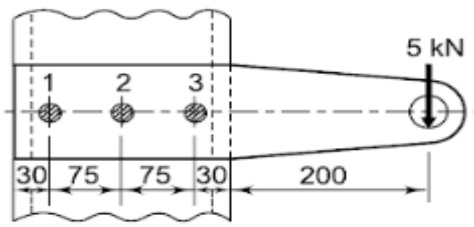
   (b) State and derive the relations for the following theories of failures? 9M
      i. Maximum principal stress theory
      ii. Maximum principal strain theory
      iii. Maximum strain energy theory

(OR)

4. (a) State fatigue stress concentration factor and notch sensitivity? 4 M
   (b) A simply supported beam has a concentrated load at the centre which fluctuates from a value of P to 4 P. The span of the beam is 500 mm and its cross-section is circular with a diameter of 60 mm. Taking for the beam material an ultimate stress of 700 MPa, a yield stress of 500 MPa, endurance limit of 330 MPa for reversed bending, and a factor of safety of 1.3, calculate the maximum value of P. Take a size factor of 0.85 and a surface finish factor of 0.9? 10M

UNIT – III

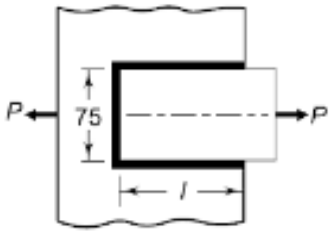
5. (a) Explain bolts of uniform strength? 4 M
   (b) A steel plate subjected to a force of 5 kN and fixed to a channel by means of three identical bolts as shown in figure. The bolts are made from plain carbon steel having tensile yield strength of 380 MPa and factor of safety 3. Find the size of the bolts? 10M



(OR)

6. (a) Discuss different types of welded joints? 4 M

(b) A plate, 75 mm wide and 10 mm thick, is joined with another steel plate by means of single transverse and double parallel fillet welds as shown in figure. The joint is subjected to a maximum tensile force of 55 kN. The permissible tensile and shear stresses in the weld material are 70 and 50 MPa respectively. Determine the required length of each parallel fillet weld? 10M



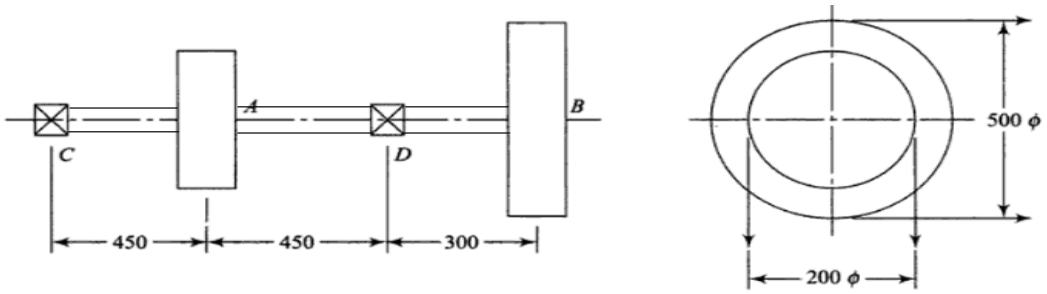
UNIT – IV

7. (a) Mention standard sizes of shafts and briefly explain the material used for Shafts? 6 M

(b) A hollow shaft is required to transmit 590 kW at 110 rpm. The maximum torque being 20% greater than the mean torque. The shear stress is not to exceed 63 MPa and the twist in a length of 3 meters is not to exceed 1.4^0. Calculate the external diameter of the shaft. Assume d/D = 0.6 and G= 84 GPa? 8 M

(OR)

8. (a) For the shafts as shown in figure, the ratio of belt tension for either belt is 3: 1. The maximum tension in the belt is 3000 N. The yield shear strength of shaft material is 200 MPa. K_m = 1.5, K_t = 1.2. Determine the shaft diameter when the pulleys are keyed to the shaft? 14M



UNIT-V

9. (a) Two tie rods connected by sleeve cotter joint and subjected to an axial pull of 53.2 kN. The overload factor 1.25 may also be considered. Determine the thickness of the cotter for equal strength of rod in tensile and crushing failures. Design the joint using $\sigma_y = 60$ MPa, $\sigma_c = 70$ MPa, τ_y= 30 MPa for rods and cotter and using $\sigma_y = 65$ MPa, $\sigma_c = 100$ MPa and τ_y= 45 MPa for sleeve of cast steel? 14M

(OR)

10. Design a cast iron flange coupling for joining two mild steel shafts transmitting 100 kW at 250 rpm. The angle of twist is not exceeding 1^0 in length of 25 mm diameters. The allowable shear stress for shaft, key is 40 MN/m^2, for a bolt is 28 MN/m^2 and cast iron is 15 MN/m^2. The modulus of rigidity for shaft material is 80 GPa ? 14M

Q.P. Code: 557412 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
SUB: HEAT TRANSFER (ME)

Time : 3 Hours | Max. Marks: 70

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

UNIT - I

1. (a) Discuss various modes of heat transfer — 6M
   (b) Heat is generated within a sphere at 2.07×10^8 W/m$^{3.}$ The sphere is 8cm in diameter. The surface temperature is 370 K. Calculate (i) The temperature at the center of the sphere. (ii) The temperature at a radial distance of 2cm. Take the thermal conductivity of material as 400 W/mK — 8M

(OR)

2. (a) Derive the expression for critical radius of insulation for cylinder — 6M
   (b) An interior wall of a furnace may be approximated by a 10.2 cm layer of common brick with thermal conductivity of 0.7 W/mK followed by 3.79 cm layer of gypsum with thermal conductivity of 0.48 W/mK. What is the thickness of loosely packed rock wool of thermal conductivity 0.065W/mK should be placed between two layers so as to reduce the heat transfer by 80%? — 8M

UNIT – II

3. (a) Explain the importance of Heisler charts used in solving the transient heat conduction problems — 4M
   (b) A slab of Aluminum 10 cm thick is originally at a temperature of 500^0C. It is suddenly immersed in a liquid at 100^0C resulting in a heat transfer coefficient of 1200 W/m^{2}K. Determine the temperature at the centerline and the surface 1 min after the immersion. The properties of aluminum for the given condition are $\alpha = 8.4 \times 10^{-5}$ m^2/s, K= 215 W/mK, ρ= 2700 kg/ m^3, Cp = 0.9 KJ/kg-K. — 10M

(OR)

4. Explain heat transfer in a long fin in terms of temperature distribution, efficiency and effectiveness. — 14M

UNIT – III

5. Write short notes on: — 6M
   (a) (i) Gray body (ii) Emissivity (iii) Radiation shape factor
   (b) Two concentric spheres of diameters d_1 = 0.8 m and d_2 = 1.2 m have surface temperatures T_1 = 450 K and T_2 = 300 K respectively. If the surface emissivities are 0.5 and 0.05 respectively, Determine the net radiation heat exchange between the two spheres — 8M

(OR)

6. (a) State Kirchoff's and Wein's laws of thermal radiation. Derive the Wein's law from basic Planck's distribution law. — 7M
   (b) A gray surface is maintained at a temperature of 860^0C. If the maximum spectral emissive power at that temperature is 1.5×10^{10} W/m^2, determine the emissivity of the body and the wavelength corresponding to maximum spectral intensity of radiation. — 7M

UNIT – IV

7. Engine oil at 20^0C flows with a velocity of 1 m/s across a 2.5 cm diameter tube which is maintained at 100^0 C. Determine the average heat transfer coefficient and rate of heat transfer per m length of the tube. 14M

(OR)

8. (a) Explain the following Dimensionless numbers along with their physical significance. 6M
   (i) Reynolds number (ii) Prandtl number (iii) Nusselt number
   (b) Water at 10^0C flows over a flat plate of 1 m x 1 m at 90^0C with a velocity of 2 m/s. Then find the length of the plate over which the flow is laminar and the rate of heat transfer over the entire plate. 8M

UNIT-V

9. (a) Discuss the Film wise and Drop wise condensation processes with example. 6M
   (b) Water is boiled at the rate of 25 kg/h in a polished copper, 280 mm in diameter at atmospheric pressure. Assuming nucleate boiling conditions, calculate the temperature of the bottom surface of the pan. 8M

(OR)

10. (a) What is fouling? What is its effect on heat transfer rate in a heat exchanger? 4M
    (b) Water enters a parallel flow double-pipe heat exchanger at 15^0C, flowing at the rate of 1200 kg/h. It is heated by oil (C_p = 2000 J/kg K), flowing at the rate of 500 kg/h from an inlet temperature of 90^0C. For an area of 1 m^2 and an overall heat transfer coefficient of 1200 W/m^2K, determine the heat transfer and the outlet temperatures of water and oil. 10M

Q.P. Code: 656412 **SET - 2**

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

B. Tech. V Sem. (R15) Supplementary Examinations of May 2019

SUB: MICROPROCESSOR AND INTERFACING (CSE)

Time : 3 Hours Max. Marks: 70

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

UNIT - I

1.	(a)	Explain in detail about 8086 interrupts	7M
	(b)	Draw and explain the memory read & write machine cycle in minimum mode.	7M
		(OR)	
2.		Explain the 40 pins of 8086 microprocessor with neat diagram	14M

UNIT – II

3.	(a)	Write an assembly language program in 8086 to sort an array of 15 numbers in ascending order.	8M
	(b)	Write an ALP in 8086 to divide 16 bit number by 8 bit number.	6M
		(OR)	
4.	(a)	Explain various assembler directives with examples.	7M
	(b)	Write an ALP in 8086 to search for a byte in a given set of 10 numbers.	7M

UNIT – III

5.	(a)	Explain DMA interface to 8086 microprocessor.	7M
	(b)	What are the registers available in DMA? Explain their functions with neat diagrams?	7M
		(OR)	
6.	(a)	Explain the RS – 232 Serial interface standard with diagram	7M
	(b)	Explain IEEE – 488 GPIB standard	7M

UNIT – IV

7.	(a)	With neat diagram explain about interfacing of DAC to microprocessor.	7M
	(b)	Interface two 8K*8 EPROM chips with 8086, such that the memory address range assigned to it is F0000 H – F3FFF H using an address decoder and logic gates	7M
		(OR)	
8.		Explain interfacing of Stepper motor to 8086 microprocessor with neat diagram.	14M

UNIT-V

9.	(a)	Compare the register set of 80486 microprocessor with the 80386 microprocessor?	7M
	(b)	Explain the memory paging mechanism of 80386 microprocessor?	7M
		(OR)	
10.	(a)	List salient features of Pentium and Pentium pro microprocessor.	7M
	(b)	Explain about Pentium Memory management.	7M

Q.P. Code: 656612

SET - 2

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

B. Tech. V Sem. (R15) Supplementary Examinations of May 2019

SUB: ADVANCED COMPUTER ARCHITECTURE (CSE)

Time : 3 Hours Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

UNIT - I

1.		Explain in detail about Multivector and SIMD Computers.	14M
		(OR)	
2.	(a)	Write a short note on Levels of parallelism in Program Execution	7 M
	(b)	Describe Gain packing and scheduling in detail	7 M

UNIT – II

3.		Explain in detail about Parallel Processing applications with examples.	14M
		(OR)	
4.	(a)	Describe Three generations of Multicomputers.	7 M
	(b)	Write about Snoopy Bus Protocols.	7 M

UNIT – III

5.	(a)	Explain Mainframes and MiniSupercomputers in detail.	7 M
	(b)	Describe Fujitsu VP2000 and VPP500 Architectures with a neat sketch	7 M
		(OR)	
6.		With Examples explain Vector Instruction Types and vector access memory schemes.	14M

UNIT – IV

7.		Explain Scalable and Multithreaded architectures in detail.	14M
		(OR)	
8.		Describe different Latency-Hiding techniques in detail.	14M

UNIT-V

9.		Explain various code optimization and scheduling techniques in detail.	14M
		(OR)	
10.	(a)	Explain Y-MP, Paragon and CM-5 Environment in detail.	7 M
	(b)	Differentiate Synchronous and Asynchronous Message Passing program development.	7M

Q.P. Code: 656812 **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Supplementary Examinations of May 2019
SUB: COMPILER DESIGN (CSE)

Time : 3 Hours Max. Marks: 70

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

UNIT - I

1. (a) Explain the analysis and synthesis model of a compiler. 4M
   (b) Explain various phases of a compiler. Explain each phase in detail and write down the output of each phase for the expression a:= b+c*4. 10M

(OR)

2. (a) Explain LEX tool and write a LEX program to identify tokens like identifiers, numbers and keywords. 8M
   (b) Explain about error recovery in Lexical analysis. 6M

UNIT – II

3. (a) State whether the following grammar is LL(1) or not. Justify the answer. 7M
   $S \Rightarrow a\ B\ C\ d \mid d\ C\ B\ e$
   $B \Rightarrow b\ B \mid \varepsilon$
   $C \Rightarrow c\ a \mid a\ c \mid \varepsilon$
   (b) How Operator precedence parse table is constructed for an operator grammar. Also explain Operator Precedence Parsing with example. 7M

(OR)

4. (a) Construct LALR parsing table for the following grammar 8M
   $S \rightarrow CC$
   $C \rightarrow cC/d$
   (b) Explain the role of Parser generator? 6M

UNIT – III

5. (a) What do you mean by the strength of attribute grammars? Explain. 6M
   (b) What is Syntax Directed Translation? In brief explain about 8M
   (i) S- attributed definitions (ii) L –attributed definitions.

(OR)

6. (a) Write SDT syntax tree for the arithmetic expressions. 7M
   (b) Explain about Type conversion. 7M

UNIT – IV

7. (a) Explain various storage allocation strategies with diagram. 7M
   (b) Define Symbol table? Explain various data structures used for implementation of symbol tables. 7M

(OR)

8. (a) Elaborate about the representation of the three address statement in intermediate code generation. 7M
   (b) List and explain the basic reasons why stack allocation strategy cannot be used for activation records. 7M

UNIT-V

9. (a) Write the Generic code generation algorithm along with getreg() function. 7M
   (b) Elaborate Peephole optimization technique. 7M

(OR)

10. (a) Distinguish between Machine Dependent and Independent optimization. 7M
    (b) Explain the principles sources of optimization with suitable examples. 7M

Q.P. Code: 657012 **SET - 2**

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

B. Tech. V Sem. (R15) Supplementary Examinations of May 2019

SUB: SOFTWARE ENGINEERING (CSE)

Time : 3 Hours Max. Marks: 70

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

UNIT - I

1.	(a)	What is a myth? Give a focus on various software myths regarding Management and Practitioner.	7M
	(b)	What are the advantages of iterative development? Compare iterative development with Incremental delivery approach.	7M
		(OR)	
2.	(a)	What are the goals of Requirement Engineering? What are the tasks performed in requirement engineering?	7M
	(b)	Explain Data Modeling Concepts	7M

UNIT – II

3.		Explain the ways and means for collecting the software requirements and how are they organized and represented?	14M
		(OR)	
4.	(a)	Explain briefly about requirements validation.	7M
	(b)	Write short note on Eliciting Requirements.	7M

UNIT – III

5.		What are the design principles of a good software design? Explain.	14M
		(OR)	
6.	(a)	Briefly Explain Software design process.	7M
	(b)	How to characterize a good software design?	7M

UNIT – IV

7.		What is black box testing? Is it necessary to perform this? Explain various test activities	14M
		(OR)	
8.		What are the various testing strategies to software testing? Discuss them briefly.	14M

UNIT-V

9.		Explain Staffing Level Estimation and Scheduling.	14M
		(OR)	
10.	(a)	What are the objectives of software Maintenance? Explain in detail maintenance metrics.	7M
	(b)	Explain software configuration management in detail. Give various roles and responsibilities in it.	7M

Q.P. Code: 657212 **SET - 2**

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

B. Tech. V Sem. (R15) Supplementary Examinations of May 2019

SUB: COMPUTER NETWORKS (CSE)

Time : 3 Hours Max. Marks: 70

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

UNIT - I

1.	(a)	Define network?	**4 M**
	(b)	Write about Wireless LAN 802.11?	**10 M**
		(OR)	
2.		Explain about the concept of Internet ?	**14 M**
		UNIT – II	
3.	(a)	Explain about Collision free protocols?	**6 M**
	(b)	Explain about Aloha? Explain about various types of Aloha Techniques?	**8 M**
		(OR)	
4.		Describe and discuss the data link layer design issues.?	**14 M**
		UNIT – III	
5.	(a)	Explain about network layer design issues?	**6 M**
	(b)	Explain about optimality principal and discuss about Link state routing algorithm ?	**8 M**
		(OR)	
6.		Explain about Requirements and techniques for achieving good quality of service in Network Layer	**14 M**
		UNIT – IV	
7.	(a)	Explain about Transport Layer Services ?	**8 M**
	(b)	Explain about Remote Procedure Call in UDP?	**6 M**
		(OR)	
8.		Explain in detail about UDP?	**14M**
		UNIT-V	
9.		Write about E-Mail ?	**14M**
		(OR)	
10.		Write about World Wide Web?	**14M**

Q.P. Code: 657412 **SET - 2**

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

B. Tech. V Sem. (R15) Supplementary Examinations of May 2019

SUB: WEB TECHNOLOGIES (CSE)

Time : 3 Hours Max. Marks: 70

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

UNIT – I

1.	(a)	Define WAMP	2M
	(b)	Explain the installation process of WAMP	12M
		(OR)	
2.	(a)	Write short notes on XAMPP and WAMP	6M
	(b)	Explain about Apache 1.1 web server	8M

UNIT – II

3.	(a)	Explain the elements of table tag with an example	6M
	(b)	Design a simple HTML page which demonstrates the use of frameset	8M
		(OR)	
4.	(a)	Explain in detail about various types of cascading style sheets	8M
	(b)	Explain how to use Dynamic HTML with Java Script.	6M

UNIT – III

5.	(a)	Explain different types of operators in PHP with example	7M
	(b)	Explain PHP functions in detail with example	7M
		(OR)	
6.	(a)	Explain Abstract classes and methods in PHP with example	7M
	(b)	Write a PHP program that explains the use of class destructors	7M

UNIT – IV

7.	(a)	What is a session? Explain briefly about sessions in PHP	6M
	(b)	How to set a cookie on user computer? Explain with an example	8M
		(OR)	
8.	(a)	Explain briefly how to use the header( ) function in different ways	7M
	(b)	Explain working with Date and Time in PHP	7M

UNIT-V

9.	(a)	Write short notes on GET and POST methods	8M
	(b)	Explain the process of working with multiple forms	6M
		(OR)	
10.	(a)	Write PHP code to connect to a MySQL Database	8M
	(b)	Draw and explain in detail about MVC Architecture	6M