Q.P. Code: 256412 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018
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) What are the assumptions made in the linear programming problems? 4M
   (b) Solve the following LP problem using graphical method. 10M

   Maximize $Z = 6X_1 + 8X_2$

   Subject to: $5X_1 + 10X_2 \leq 60$, $4X_1 + 4X_2 \leq 40$, X_1 and $X_2 \geq 0$.

   (OR)

2. (a) Define the following properties of linear programming solution. 4M
   (i) Feasible solution (ii) Infeasible solution
   (iii) Optimal solution (iv) Unbounded solution
   (b) Solve the following LP problem using simplex algorithm. 10M

   Maximize $Z = 3X_1 + 4X_2$

   Subject to: $X_1 + X_2 \leq 450$, $2X_1 + X_2 \leq 600$, X_1 and $X_2 \geq 0$.

UNIT – II

3. (a) Form the dual of the following primal problem. 4M

   Minimize $Z = 5X_1 + 8X_2$

   Subject to: $4X_1 + 9X_2 \geq 100$, $2X_1 + X_2 \leq 20$, $2X_1 + 5X_2 \geq 120$, X_1 and $X_2 \geq 0$.

   (b) Solve the following LP problem using dual simplex method. 10M

   Minimize $Z = 2X_1 + 4X_2$

   Subject to: $2X_1 + X_2 \geq 4$, $X_1 + 2X_2 \geq 3$, $2X_1 + 2X_2 \leq 12$, $X_1, X_2 \geq 0$.

   (OR)

4. Solve the following LP problem if the right hand side constants of the constraints are changed from 60 and 40 to 20 and 40 respectively. 14M

   Maximize $Z = 6X_1 + 8X_2$

   Subject to: $5X_1 + 10X_2 \leq 60$, $4X_1 + 4X_2 \leq 40$, $X_1, X_2 \geq 0$.

UNIT – III

5. Obtain the initial basic feasible solution to the following transportation problem using: 14M
   (a) least cost method (b) Vogel's approximation method.

	A	B	C	D	**Supply**
1	11	13	17	14	**250**
2	16	18	14	10	**300**
3	21	24	13	10	**400**
Demand	**200**	**225**	**275**	**250**	

   (OR)

6. A department head has four subordinates, and four tasks to be performed. The subordinates differ in efficiency, and the tasks differ in their intrinsic difficulty level. His estimate, of the time each man would take to perform each task, is given in the matrix below. How should the tasks be allocated, one to a man, so as to minimize the total man-hours. 14M

Task	Men			
	E	F	G	H
A	10	12	15	12
B	7	16	14	14
C	13	14	7	9
D	12	10	11	13

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

(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	8	12	7	10	11	9
m/c 2	10	7	11	6	12	8

(OR)

8. Solve the following travelling sales man problem so as to minimize the cost per cycle. 14M

From \ To	A	B	C	D	E
A	-	3	6	2	3
B	3	-	5	2	3
C	6	5	-	6	4
D	2	2	6	-	6
E	3	3	4	6	-

UNIT-V

9. Alpha logistic company has to load a cargo out of four items whose details are shown below. The maximum weight of the cargo is 7 tons. Find the optimal cargo loading using dynamic programming method such that the total return is maximized. 14M

item, i	1	2	3	4
Weight, w_i / unit (in tons)	2	1	4	3
Return, r_i / unit (in rupees)	1000	400	2100	1400

(OR)

10. An oil company has 8 units of money available for exploration of three sites. If oil is present at a site, the probability of finding it depends upon the amount allocated for exploiting the site, as given below. The probability that oil exists at the sites 1, 2 and 3 is 0.4, 0.3 and 0.2 respectively. Find the optimal allocation of money. 14M

	Units of money allocated								
	0	1	2	3	4	5	6	7	8
Site 1	0.0	0.0	0.1	0.2	0.3	0.5	0.7	0.9	1.0
Site 2	0.0	0.1	0.2	0.3	0.4	0.6	0.7	0.8	1.0
Site 3	0.0	0.1	0.1	0.2	0.3	0.5	0.8	0.9	1.0

Q.P. Code: 256612 **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018
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. Describe the necessity of having a planned water supply scheme for a town. How are such schemes financed, planned and executed? Discuss with special reference to the circumstances prevailing in India. 14M

(OR)

2. (a) Explain any three methods of estimating the future population of a city. What are their relative merits? 7M
   (b) Assuming the geometric rate of growth of population of a town, calculate the population of the town in the year 2038 with help of the following census records of the population. 7M

Year	1998	2008	2018
Population in thousand	260	500	750

UNIT – II

3. (a) Under what circumstances impounded reservoirs are constructed? What factors should be considered while selecting the site of on impounded reservoir? 7M
   (b) Describe the working of a canal intake. 7M

(OR)

4. (a) Write a note on various water borne diseases. 7M
   (b) Give the tabular form the standards of drinking water as described by (i) A.C.M.R., (ii) W.H.O., (iii) A.W.W.A. (iv) Manual by M.U.D. 7M

UNIT – III

5. (a) What are the various processes required to remove the various types of impurities? Give a neat sketch showing the various processes required in treating river water, starting from the source of water. 7M
   (b) Design a coagulation-cum-sedimentation tank with continuous flow for a population of 60,000 persons with a daily per capita water allowance of 120 litres. Make suitable assumptions where needed. 7M

(OR)

6. (a) What is meant by ‘disinfection’ in treating public water supply? What is its importance? What are the chemicals used as disinfectants and what are their comparative merits and demerits. 7M
   (b) Design slow sand filter for the following data: Population: 1 Lakh, Per capita demand: 140 liters/day, total maximum demand 1.5 times average. Indicate general arrangement of filter beds. 7M

UNIT – IV

7. (a) Explain, with the help of diagrams, various methods of aeration. 7M
   (b) Differentiate between permanent and temporary hardness. How do you remove temporary hardness? 7M

(OR)

8. (a) Explain about the causes and effects of water pollution. 7M
   (b) Write a note on activated carbon treatment. 7M

UNIT-V

9.	(a)	Write a brief note on valves used in pumping system.	7M
	(b)	Explain Hardy Cross method of solving the network, by balancing heads by correcting flow. Derive the expression you use for correction of the assumed flow.	7M
		(OR)	
10.	(a)	How do you assess the water demand of the buildings to be used for different purposes?	7M
	(b)	Explain with a neat sketch as to how municipal water mains are connected to private buildings and houses for giving water supply connections.	7M

Q.P. Code: 256812 **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018
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.

UNIT - I

1.	(a)	What are the characteristics of a good ordinary Portland cement.	7M
	(b)	What are the main compounds of ordinary Portland cement and what are their properties.	7M
		(OR)	
2.	(a)	What is meant by heat of hydration of cement, briefly explain it.	7M
	(b)	Write short note on accelerating admixtures that are used in cement.	7M

UNIT – II

3.	(a)	What are the physical properties of an aggregate that you will consider for making concrete.	7M
	(b)	What is meant by alkali aggregate reaction in concrete, briefly explain it.	7M
		(OR)	
4.	(a)	What are the different tests that are used for measuring the workability of concrete, explain the most commonly used workability test either in the field or in laboratory.	7M
	(b)	What are the considerations that you will consider while using vibrators for compacting the fresh concrete.	7M

UNIT – III

5.	(a)	Differentiate between static modulus of elasticity of concrete and dynamic modulus of elasticity of concrete.	7M
	(b)	What is meant by durability of concrete, why this aspect is to be considered in making the concrete.	7M
		(OR)	
6.	(a)	What is meant by creep in a concrete structure, what are the factors that influence the creep in concrete.	7M
	(b)	What are the general chemical attacks on concrete, briefly explain about sulphate attack on concrete.	7M

UNIT – IV

7.	(a)	What are the different methods that are adopted for curing of concrete, what are the effects of improper curing.	7M
	(b)	What are the factors that affect the measurement of pulse velocity in concrete.	7M
		(OR)	
8.	(a)	What are the factors that influence the strength of concrete.	7M
	(b)	Explain in brief about the Schmidt rebound hammer test with a sketch.	7M

UNIT-V

9.	(a)	What are the variables that are involved in the mix design of concrete and what are the various methods of proportioning in mix design of concrete.	7M
	(b)	Explain in detail about high strength concrete.	7M
		(OR)	
10.	(a)	Define the term mix design of concrete and explain its significance.	7M
	(b)	What are the different steps involved in I.S recommended method (I.S:10262-1982) of concrete mix design	7M

Q.P. Code: 257012 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018
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) Define Hydrology. Discuss the various practical applications of hydrology. 7M
   (b) The isohyets drawn for a storm which occurred over a drainage basin of area 509 km^2 yielded the following information.

Isohyet interval in mm	70-80	80-90	90-100	100-110	110-120	120-130
Area between isohyets in km^2	10	85	113	98	136	67

Determine the average depth of rainfall over the basin. 7M

(OR)

2. (a) Describe with a neat sketch, the principle of working of Symon's non-recording rain gauge. 7M
   (b) The average annual rainfalls at 4 existing rain gauge stations in a basin are 105, 79, 70, and 66 cm. If the average depth of rainfall over the basin is to be estimated within 10% error, determine the additional number of gauges needed. 7M

UNIT – II

3. (a) What is the process of evaporation? Describe briefly the various methods of estimating evaporation from water bodies. 7M
   (b) What is evapotranspiration? Describe the various factors affecting evapotranspiration. 7M

(OR)

4. (a) Define Φ-index and W-index and bring out the difference between them. How is the Φ-index determined from the rainfall hyetograph? 7M
   (b) A storm with a uniform intensity of 1.6 cm/h for a period of 8 hours occurring over a basin of area 650 km^2 produced a runoff estimated to be 57.2 million m^3. Find the average infiltration rate during the storm. 7M

UNIT – III

5. (a) What is runoff? Explain the various components of runoff. 7M
   (b) Given below are the ordinates of a 4 hour Unit Hydrograph (UH). Using this, derive the ordinates of a 8 hour Unit Hydrograph (UH) for the same catchment.

Time(h)	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34
Ordinates of 4 h UH (m^3/s)	0	12.52	21.32	23.54	17.84	14.79	12.18	10.04	8.26	6.51	4.98	3.95	3.05	2.26	1.60	1.07	0.53	0

7M

(OR)

6. (a) Explain the discharge measurement by area-velocity method. 7M
   (b) The 3 h unit hydrograph of a basin can be approximated as a triangle with a base period of 75 h and a peak discharge of 55.5 m^3/s. What is the area of the basin? At what time the peak discharge occurs?

7M

UNIT – IV

7. (a) The construction of a main dam takes 4 years for completion. For what return period would you design a coffer dam to provide 95% assurance that the coffer dam will not fail before the construction of main dam? What would be the return period if the assurance is increased to 99%? 5M

   (b) Distinguish between
   (i) Maximum probable flood and Design flood
   (ii) Annual series and Partial series and
   (iii) Return period and Exceedence probability. 9M

(OR)

8. (a) Explain the method of determining the Muskingum parameters K and x of a reach from a pair of observed inflow and outflow hydrographs. 7M

   (b) What is flood control? Explain any two methods of flood control. 7M

UNIT-V

9. (a) With a neat sketch, explain the terms :
   (i) Cone of depression,
   (ii) Radius of influence
   and (iii) Drawdown. 7M

   (b) In an artesian aquifer of 8 m thickness, a 10 cm diameter well is pumped at a constant rate of 100 lit/minute. The steady state drawdown observed in two wells located at 10 m and 50 m distances from the centre of the well are 3 m and 0.05 m respectively, compute the transmissivity and the hydraulic conductivity of the aquifer. 7M

(OR)

10. (a) Explain how the yield of an open well is calculated. 7M

    (b) During a recuperation test conducted on an open well in a region, the water level in the well was depressed by 3 m and it was observed to rise by 1.75 m in 75 minutes. (i) What is the specific yield of open wells in that region? (ii) What could be the yield from a well of 5 m diameter under a depression head of 2.5 m? (iii) What should be the diameter of the well to give a yield of 12 lit/s under a depression head of 2 m? 7M

Q.P. Code: 257212 **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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) Discuss the number and depth of bore hole studies in Geotechnical investigation. 7 M
   (b) Enumerate geophysical methods and describe electrical resistivity method. 7 M

(OR)

2. (a) Discuss the types of soil samples and soil samplers. 7 M
   (b) How the standard penetration test is conducted in the field. 7 M

UNIT – II

3. (a) Explain the Culmann's graphical construction for active earth pressure determination. 8 M
   (b) Explain different types of earth pressure and derive the equation for coefficient of active earth pressure from basics. 6 M

(OR)

4. (a) A 8 m high retaining wall with smooth vertical back retains a two layer sand backfill. The properties of soil from 0 to 3 m include $\varphi = 35^o$ and $\gamma = 22$ kN/m^3 and those from 3 m to 8 m include $\varphi = 30^o$ and $\gamma = 20$ kN/m^3. Determine the total active earth pressure. 8 M
   (b) Discuss the stability requirements of the gravity retaining wall. 6 M

UNIT – III

5. (a) Differentiate between local and general shear failure. 5 M
   (b) A square footing of 2 m size is laid at a depth of 1.3 m below the ground surface. The soil properties are $\gamma = 20$ kN/m^3, $\gamma_{sat} = 22$ kN/m^3, $\varphi = 25^o$ and $c = 0$ kN/m^2. Determine the net ultimate bearing capacity if (i) the water table rises to the level of the base and (ii) the water table is 1 m below the base. Take $N_c = 14.8$, $N_q = 5.6$ and $N_\gamma = 3.2$. 9 M

(OR)

6. (a) Explain the Meyerhof 's bearing capacity theory . How does it differ from Terzaghi's theory? 7 M
   (b) Determine the allowable gross load and the net allowable load for a circular footing of 2 m diameter and with a depth of foundation 1.0 m. Use Terzaghi's theory. Take a factor of safety = 3.0. The soil at the site has $\gamma = 18$ kN/m^3, $\varphi = 25^o$ and $c = 15$ kN/m^2. Take $N_c = 14.8$, $N_q = 5.6$ and $N_\gamma = 3.2$. 7 M

UNIT – IV

7. (a) Classify the piles based on (i) function or action and (ii) installation. 7 M
   (b) A group of 9 piles with 3 piles in a row were driven into soft clay. The diameter and length of piles were 30 cm and 10 m respectively. The unconfined compression strength of the clay is 70 kN/m^2. If the piles are placed at 90 cm centre to centre, compute the allowable load on the pile group with a factor of safety of 2.5. Take adhesion factor as 0.7. 7 M

(OR)

8. (a) Explain the pile load test to determine the load carrying capacity of pile. 8 M
   (b) A concrete pile is driven with a drop hammer weighing 20 kN and having a free fall of 1 m. The total penetration of the pile in the last five blows is 30 mm. Determine the load carrying capacity of the pile using ENR formula. 6 M

UNIT-V

9. (a) Explain the method of slices to determine the factor of safety of finite slopes. 7 M

(b) Calculate the factor of safety with respect to cohesion of a clay slope laid at 1 in 2 to a height of 10 m, if $\varphi = 10^o$, c = 25 kN/m^2 and γ = 20 kN/m^3. What will be the critical height of slope in this soil. Assume stability number, S_n = 0.064. 7 M

(OR)

10. (a) What are the different factor of safety used in the stability of slopes? Discuss about Taylor's stability chart. 7 M

In order to find the factor of safety of d/s slope of an earth dam during steady seepage, the section of the dam was drawn to a scale of 1 cm = 4 m and the following results obtained on a slip circle:

(b) Area of N - rectangle = 14.4 cm^2 , Area of T - rectangle = 6.4 cm^2 , Area of U - rectangle = 6.9 cm^2 , length of arc = 12.6 cm. The laboratory tests on soil gave effective angle of shear resistance as 26^o and cohesion as 19.5 kN/m^2. Determine the factor of safety of the slope. Unit weight of soil is 19 kN/m^3. 7 M

Q.P. Code: 257412 **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018
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. (a) In a two dimensional stress system stresses at a point in a material are 80Mpa compression and 60 MPa shearing on one plane and 40 MPa tensile and a shearing stress in a another plane at 60^0 to the first one. Determine the value of the shearing stress in the second plane and the principal stresses and position of their planes. 7M

   (b) A piece of material is subjected to two perpendicular tensile stresses of 120 MPa and 80 MPa. Determine the plane on which the resultant stress has maximum obliquity with the normal. Also find the resultant stress on the plane. 7M

(OR)

2. Determine the diameter of a bolt which is subjected to an axial pull of 15 kN together with a transverse shear force of 8 kN, when the elastic limit in tension is 250 N/mm^2 , factor of safety =3 and poison's ratio =0.3 using 14M
   (i) Maximum principal stress theory
   (ii) Maximum principal strain theory
   (iii)Maximum shear stress theory
   (iv) Maximum strain energy theory
   (v) Maximum shear strain energy theory

UNIT – II

3. A cylindrical vessel, whose ends are closed by means of rigid flange plates, is made of steel plate 5 mm thick. The length and the internal diameter of the vessel are 60 cm and 30 cm respectively. Determine the longitudinal and hoop stresses in the cylindrical shell due to an internal fluid pressure of 2.5 N/mm^2. Also calculate the increase in length, diameter and volume of the vessel. Take $E=2x10^5$ N/mm^2 and poissions ratio 0.3. 14M

(OR)

4. Derive Lame's formulae for finding the hoop stress and radial pressure in a thick cylinder. 14M

UNIT – III

5. (a) Derive Secant formula for columns under eccentric loading. 7M

   (b) Determine the ratio of strength of a solid steel column to that of a hollow column of internal diameter equal to 3/4 of its external diameter. Both the columns have the same cross section, length and end conditions. 7M

(OR)

6. (a) A column of circular section made of cast iron 180 mm external diameter and 10 mm thick is used as a column 6 m long. Both ends of the column are fixed. The column carries a load of 180 kN at an eccentricity of 15 mm from the axis of the column. Find the extreme stresses on the column section. Find also the maximum eccentricity in order that there may be no tension anywhere on the section. Take E=94000 N/mm^2. 7M

   (b) A straight bar of mild steel column 1m long and 12mmx6mm in section is mounted in strut testing machine and loaded axially till it buckles. Assuming Euler's formula for pinned ends to apply estimate the maximum central deflection before the material attain its yield point of 300 N/mm^2. Take E = $2x10^5$ N/mm^2. 7M

UNIT – IV

7. (a) A short column is made of a rectangular box section of outside dimensions 250mmX300mm and inside dimensions 140mmX200mm. Determine the permissible eccentricity along either of the principal axes of a load of 350 kN, if the permissible stresses in the tension and compression are 8 N/mm^2 and 30 N/mm^2. 10M

(b) Explain the following (i) Core of a section (ii) Combined stresses (iii) Eccentric loading (iv) Slenderness ratio. 4M

(OR)

8. (a) A small concrete dam 15m high has a top width of 2.5m and a base width of 8.5m with the water face vertical. Determine the stress intensities at the base. 4M

(b) A masonry dam of trapezoidal section is 12 m high. It has top width of 2m and bottom width of 8 m. The face exposed to water has a slope of 1 horizontal to 10 vertical. Calculate the pressure intensities at the base if the dam retains Water to a height of 10 m. Specific weight of masonry is 20 kN/ m^3. 10M

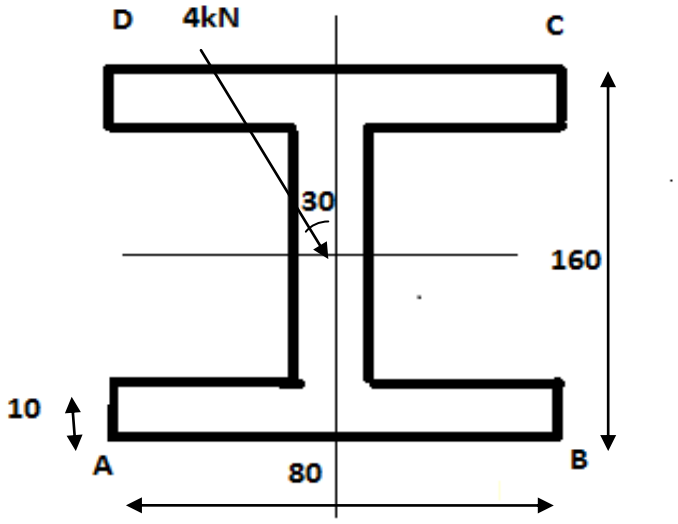
UNIT-V

9. A cantilever beam consists of 100 mm * 70 mm*10 mm unequal angle section with the shorter leg horizontal. It carries a concentrated load of 8.5 kN at a distance of 2.5m from the support and in a plane making 30^0 with respect to vertical. Determine the maximum stress at support section and also find the neutral axis of the section. 14M

(OR)

10. (a) A 8m long simply supported beam of 100mm width and 120mm depth carries a load of 20kN at the mid span. The load is inclined at 30^0 to the vertical longitudinal plane and the line of action of the load passes through the centroid of the rectangular section of the beam. Determine the stress at all the corners of the section. 7M

(b) A simple supported I-Beam of 5m span carries a central load of 4kN as shown in fig.The load acts through the centroid of the line of action is inclined at 30^0 to the vertical direction. Determine the maximum stresses. 7M



Q.P. Code: 356412 | **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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.	(a)	Give the conditions for orthogonality of real and complex signals.	7M
	(b)	Give the expressions for exponential Fourier series representation of a periodic signal.	7M
		(OR)	
2.	(a)	Classify the signals based on continuous and discrete terminology.	7M
	(b)	Enumerate the basic operations on signals with examples.	7M

UNIT – II

3.		State and prove any four properties of Fourier transforms.	14M
		(OR)	
4.		State the time scaling and convolution properties of Fourier transform.	14M

UNIT – III

5.	(a)	What is the condition for the stability of a system?	7M
	(b)	What is the condition for a LTI CT system to be causal?	7M
		(OR)	
6.		Describe the classification of systems with examples.	14M

UNIT – IV

7.		State and prove Sampling theorem.	14M
		(OR)	
8.		Define Transfer function and state its relation with Impulse function.	14M

UNIT-V

9.		Evaluate the Laplace transforms for the given signals (i) $x(t) = \sin w_0(t)u(t)$) (ii) $x(t) = e^{-3t}u(t)$	14M
		(OR)	
10.		State and prove the following properties of Z transform i) Time shifting ii) Correlation iii)Convolution	14M

Q.P. Code: 356612 **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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)	Discuss the constructional details of synchronous machine.	7M
	(b)	Derive an emf equation of an synchronous generator?	7M
		(OR)	
2.	(a)	Develop a solution for regulation of a salient pole synchronous generator.	7M
	(b)	A 550V, 55kVA, 1-Phase alternator has an effective resistance of 0.2. A field Current of 10 A produces an armature current of 200 A on short-circuit and an electromotive force of 450 V on open circuit. Calculate the full load regulation with 0.8 power factor lagging.	7M

UNIT – II

3.	(a)	Explain the Two Reaction Theory of Salient pole Synchronous machines	7M
	(b)	A synchronous generator has Xd = 0.75 p.u. and Xq = 0.5 p.u. It is supplying full-load at rated voltage at 0.8 lagging power factor. Draw the phasor diagram and compute the excitation emf.	7M
		(OR)	
4.	(a)	Develop the expression for power output of a salient pole synchronous machine	8M
	(b)	Explain the terms synchronizing power and synchronizing torque	6M

UNIT – III

5.	(a)	Derive expression for synchronizing power when two alternators are connected in parallel.	8M
	(b)	Two identical 2MVA alternators operate in parallel. The governor of first machine is such that the frequency droops uniformly from 50Hz on no-load to 47.5 Hz on fullload. The corresponding uniform speed droop of the second machine is 50Hz to 48Hz. How will they share a load of 3MW?	6M
		(OR)	
6.	(a)	Write the short notes on effect of change of excitation on the synchronous generator	7M
	(b)	Discuss in brief about the short-circuit transient in synchronous machine	7M

UNIT – IV

7.	(a)	Why synchronous motor is not self starting? Explain the methods of starting of synchronous motor.	7M
	(b)	Explain an experimental method of determining of 'V' curves for a synchronous motor	7M
		(OR)	
8.	(a)	Explain hunting of synchronous machines and methods of its prevention.	7M
	(b)	Describe how a synchronous motor can be operated as a synchronous condenser.	7M

UNIT-V

9.	(a)	Write short notes on double revolving field theory?	7M
	(b)	A universal series motor has a resistance of 30Ω and an inductance of 0.5H. When connected to a 250V DC supply and loaded to take 0.8A, it runs at 2000rpm. Estimate its speed and power factor when connected to a 250V, 50Hz ac supply and loaded to take the same current.	7M
		(OR)	
10.	(a)	Explain construction and working principle of hysteresis motor.	7M
	(b)	Explain construction, working and applications of switched reluctance motor.	7M

Q.P. Code: 356812 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018
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. (a) Explain the following terms 6M
   (i) Surge impedance
   (ii) Velocity of propagation
   (iii) Attenuation constant
   (b) A 20 km long, three-phase system delivers 6 MW at 11 kV at a power factor of 0.8(lag). Line reactance is 5 Ω and resistance is 1.5 Ω. Calculate the sending end voltage and regulation. Also, find the power factor at which the regulation becomes zero. 8M

(OR)

2. (a) Derive the voltage and current relation for a long transmission line. 8M
   (b) Determine the efficiency and regulation of a three-phase, 50 Hz transmission line which delivers a balanced load of 24 MVA at 0.8 lagging power factor. The receiving end voltage is 66 kV. Resistance, inductance and capacitance per phase are 9.6 Ω, 0.097 H and 0.765 μF respectively. Use nominal T method. Neglect the leakage drop 6M

UNIT – II

3. (a) What is per unit system? Discuss in brief about the single line diagram and its importance. What are the assumptions that are made while drawing a single line diagram? 7M
   (b) A single phase transformer of 11 kV/ 400 V, 50 Hz 150 kVA has primary resistance and reactances are 2 Ω and 10Ω respectively, the secondary resistance and reactances are 0.01 Ω and 0.05 Ω respectively. Determine the p.u. values of transformer. 7M

(OR)

4. (a) Write the step wise procedure to form reactance diagram from single line diagram. 4M
   (b) Draw the reactance diagram for the power system shown in Fig.1 Use a base of 50 MVA, 230 kV in 30 Ω(reactance) transmission line. The ratings of the generator, motor and transformer are 10M
   Generator = 20 MVA, 20 kV, X = 20 %
   Motor = 35 MVA, 13.2 kV, X = 25%
   Transformer 1 = 25 MVA, 18/230kV(Y/Y), X =10%
   Transformer 2 = 45 MVA, 230/ 13.8 kV(Y/Δ), X = 15%

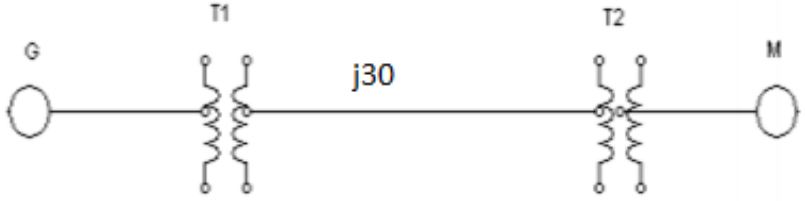


Fig. 1

UNIT – III

5. (a) Consider the four bus system as shown in Fig.2. Buses 1 and 2 are generator buses and 3 and 4 are load buses. The generators are rated 11 kV, 100 MVA with a leakage reactance of 10 % each. Both the transformers are 11/110 kV, 100 MVA with a leakage reactance of 5%. The reactances of the lines to a base of 100 MVA, 110 kV are indicated in the figure. Obtain the short circuit current for a three phase fault on bus 4. 9M

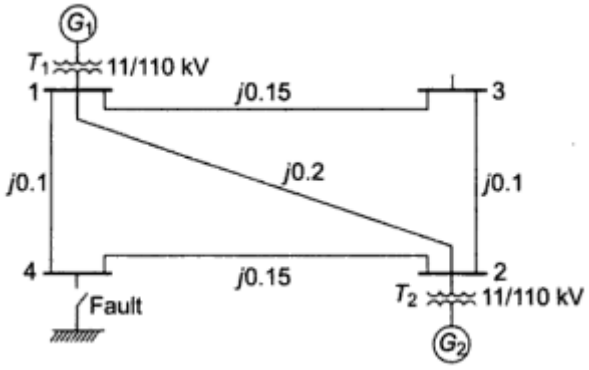


Fig. 2

(b) Why do we use series reactors in the power system? Discuss their advantages. 5M

(OR)

6. Three generators are placed in an interconnected system as shown in Fig. 3. The ratings of each generator are given below. 14M

Generator, G_A : 11 kV, 40 MVA, X = 10%

Generator , G_B *:* 11 kV, 60 MVA, X = 12%

Generator, G_C*:* 11 kV, 25 MVA, X = 10%

The generators are provided with bus bar reactors, each having X= 10% reactance based on their ratings. A feeder directly connected to generator A as shown in the figure has an impedance of Z = 0.05+j0.1 Ohms/ phase. Estimate the short-circuit MVA if a symmetrical fault occurs at the end of the feeder.

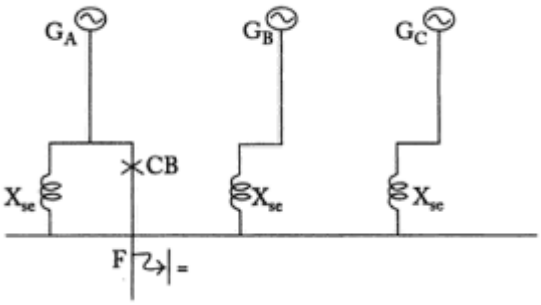


Fig. 3

UNIT – IV

7. (a) What are the various types of unsymmetrical faults? Discuss their frequency of occurrence and severity? 5M

(b) Draw the positive, negative and zero sequence impedance diagrams for different 3-phase transformer winding connections. 9M

(OR)

8. Derive the expression for fault current and the terminal voltages of a 3-phase alternator, when there is a line-to line fault occurs at the far end of the alternator. Assume the generator is solidly earthed. 14M

UNIT-V

9. (a) What do you mean by effectively grounded and non-effectively grounded systems? State the methods adopted for non-effectively grounded systems. 5M

(b) Three 6.6 kV, 3-phase, 10 MVA generators are connected to a grid. The positive sequence reactance of each generator is 0.15 pu while the negative and zero-sequence reactances are 75% and 30% of positive sequence reactances respectively. A single line-to-ground fault occurs on the grid bus. Determine the fault current if 9M

(i) All the generators' neutrals are solidly grounded

(ii) One generator's neutral is solidly grounded and other two neutrals are isolated

(iii) One generator neutral is grounded through 0.3 ohm resistance and the other two neutrals are isolated.

(OR)

10. (a) A person touches an energized tower of 0.5 s. The surface layer derating factor is found to be 0.75 for a soil resistivity 30 Ω-m at a distance 0.05 m inside the soil. Find the surface layer resistivity, touch and step potential if the body weight of the person is 50 kg. 6M

(b) Define the following terms: 8M

(a) Step voltage

(b) Touch voltage

(c) Coefficient of grounding

(d) Arcing ground

Q.P. Code: 357012 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018
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) Plot & explain the static V-I Characteristics of SCR — 8M
   (b) What is commutation? Explain any three commutation methods in DC circuits. — 6M

(OR)

2. (a) Explain the significance of Ig_{min} & Ig_{max} by plotting the gate characteristics — 8M
   (b) Explain in detail the need of equalizing network in series and parallel operation of thyristor? — 6M

UNIT – II

3. (a) Explain the operation of a single – phase fully Controlled bridge rectifier feeding R-L load. Plot the output voltage and current waveforms for discontinuous conduction mode and derive an expression for the D.C output voltage. — 8M
   (b) A 1-Φ fully controlled rectifier is operated with a resistive load of 10Ω, the source voltage is 230V 50Hz.For the firing angle of 60^0**,** determine i) Average load voltage ii) average and RMS load current. — 6M

(OR)

4. Explain the operation of a 3-Φ Fully 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 the operation of 1-Φ A.C voltage controller with R-load. Derive the expression for the R.M.S value of output voltage. — 8M
   (b) Explain the operation of single-phase step-down mid-point cyclo converters with RL load relevant output voltage and current wave forms. — 6M

(OR)

6. (a) Explain how TRIAC is used to regulate the output voltage feeding R-L 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-up bridge type cyclo converters with R load whose output frequency is six times the supply frequency. Plot the relevant output voltage and current wave forms. — 6M

UNIT – IV

7. (a) Explain Two – quadrant operation of chopper — 8M
   (b) A step-down dc chopper has a resistance load of R=15 ohm and input voltage Edc-200V. When the chopper remains ON, its voltage drop is 2.5V. The chopper frequency is 1kHz. If the duty cycle is 50%, determine: (a) Average output voltage (b) RMS output voltage (c) Chopper efficiency (d) Effective input resistance of chopper. — 6M

(OR)

8. (a) Explain the various control strategies employed for control of output voltage of chopper — 8M
   (b) Explain the operation of type A and type B Chopper with relevant output voltage and current wave forms — 6M

UNIT-V

9. (a) Draw and explain operation of a current source inverter — 8M
   (b) Explain the operation of McMurray bridge inverter — 6M

(OR)

10. (a) Explain the operation of basic parallel capacitor inverter. — 6M
    (b) Explain any two pulse width modulation techniques in detail. — 8M

Q.P. Code: 357212 **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

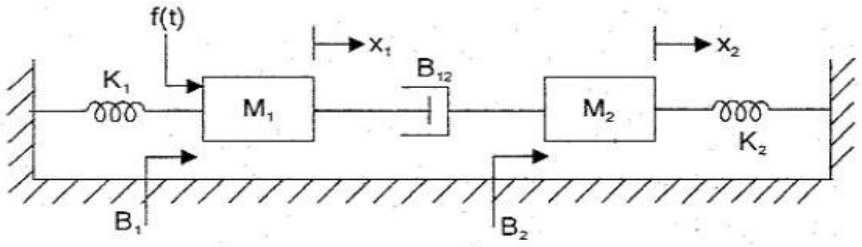
SUB: CONTROL SYSTEMS (EEE)

Time : 3 Hours Max. Marks: 70

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

UNIT - I

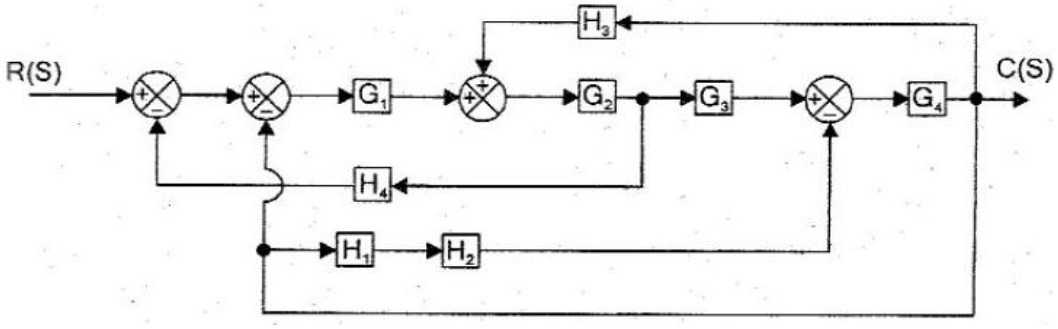
1. (a) Determine the Transfer function $X_1(S)/F(S)$ and $X_2(S)/F(S)$ for the system shown in below Fig. 12M



(b) Explain why negative feedback will prefer in designing control systems? 2M

(OR)

2. Determine the overall transfer function of the following system using block diagram reduction method. 14M



UNIT – II

3. Explain in detail the effect of P and PI controllers. 14M

(OR)

4. (a) The unity feedback system characterized by an open loop transfer function 10M

$$\frac{C(s)}{R(s)} = \frac{K}{s(s+10)}$$

(i)Determine the gain K, so that system will have damping ratio of 0.5
(ii)For the above value of K, Determine the peak over shoot and time at peak overshoot for a unit step input.

(b) Define the following 4M
(i) Delay time (ii) Raise time (iii) Peak time (iv) Peak overshoot

UNIT – III

5. (a) Construct Routh array and determine the stability of the system whose characteristic equation is $S^6 + 2S^5 + 8S^4 + 12S^3 + 20S^2 + 16S + 16 = 0$. Also determine the number of roots lying on right-half of S-plane, left-half of S-Plane and on imaginary axis. 10M

(b) Write the limitations of the Routh-Hurwitz stability criteria. 4M

(OR)

6. (a) Describe the procedural steps to be followed to construct root loci. 10M

(b) Explain the concept of BIBO stability. 4M

UNIT – IV

7. Sketch the Bode plot for the following transfer function and determine Phase margin and Gain margin. 14M

$$\frac{C(s)}{R(s)} = \frac{75(1+0.2s)}{s(s^2+16s+100)}$$

(OR)

8. (a) Explain the correlation between time and frequency Response. 8M

(b) Write short notes on (i) Phase cross over frequency (ii) Gain Margin. 6M

UNIT-V

9. Design a Lag compensator for a unity feedback system with open-loop transfer function give by 14M

$$G(s) = \frac{K}{s(s+1)(s+5)}$$

To meet the following specifications:

i. Damping ratio=0.3.
ii. Settling time = 12 sec.
iii. Velocity error constant K_V=8 Sec^{-1}.

(OR)

10. Derive the transfer function of a Lead compensator. 14M

Q.P. Code: 357412 **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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. Define Managerial Economics. Explain its nature and scope? 14M

(OR)

2. Define Demand and explain the factors that influence the elasticity of demand. 14M

UNIT – II

3. (a) What are ISOQUANTS and ISOCOST? 7M
   (b) What are the Internal economies of scale? 7M

(OR)

4. What is Cost Analysis? Explain in detail about fixed, variable and Marginal costs. 14M

UNIT – III

5. What is perfect competition? How the price determined under condition of perfect competition? 14M

(OR)

6. Write about Pricing and Methods of pricing? 14M

UNIT – IV

7. Enumerate the merits and demerits of Sole Proprietorship? 14M

(OR)

8. (a) Describe the Institutions providing Long Term Finances 7M
   (b) State the Advantages and limitations of Pay Back Period method 7M

UNIT-V

9. From the following Trial Balance of Mr. Prashanth for the year ending 31.12.2017, prepare trading, profit and loss account and balance sheet. 14M

Debit Balances	Amount (Rs)	Credit Balances	Amount (Rs)
Purchases	70,000	Sales	1,00,000
Debitors	20,000	Creditors	8,000
Sales Returns	2,000	Purchase Returns	3,000
Wages	5,000	Capital	1,50000
Salaries	8,000	Bank Loan	3,000
Land and Buildings	70,000		
Plant and Machinery	30,000		
Rent and Rates	4,000		
Furniture	20,000		
Opening Stock	6,000		
Office Expenses	9,000		
Insurance	3,000		
Cash at Bank	17,000		
TOTAL	**2,64,000**	**TOTAL**	**2,64,000**

Adjustments

a. Closing Stock Rs. 20,000
b. Outstanding Salaries Rs. 4,000
c. Prepaid Insurance Rs. 300
d. Provide Depreciation on plant and machinery @10%
e. Provide Doubtful bad debts @ 5% on Debtors

(OR)

10. What are important Ratios? Explain any five of them with examples. 14M

Q.P. Code: 456412 **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018
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 NAND gate circuit diagram and explain using function table.	7M
	(b)	Explain the CMOS inverter behavior with resistive loads.	7M
		(OR)	
2.	(a)	Explain the 10K ECL OR/NOR gate with neat circuit diagram	7M
	(b)	Write the differences between Static RAM and Dynamic RAM	7M

UNIT – II

3.	(a)	What are the data flow design elements in VHDL and explain any two elements with the example.	8M
	(b)	Write the syntax for following i) *IF* statement ii) *CASE* statement iii) *FOR* loop	6M
		(OR)	
4.	(a)	Explain the time dimension and simulation in detail.	7M
	(b)	Write VHDL architecture for prime number detector using a FOR statement	7M

UNIT – III

5.	(a)	Draw the neat logic diagram of 74×138 and explain with the help of truth table.	7M
	(b)	Write the structural VHDL code for IC 74×157	7M
		(OR)	
6.	(a)	Draw the logic diagram for the IC 74×682 8-bit comparator.	7M
	(b)	Write the behavioral VHDL code for Full adder.	7M

UNIT – IV

7.	(a)	Write the VHDL program for a 16-bit barrel shifter for left and right circular shifts.	10M
	(b)	What are the Barrel shifter components.	4M
		(OR)	
8.	(a)	Write the behavioral VHDL program for a dual priority encoder.	8M
	(b)	Write the VHDL program for 8-bit comparator.	6M

UNIT-V

9.	(a)	Write the VHDL model of a 74×74 like D flip flop with preset and clear.	7M
	(b)	Draw the logic diagram of PAL16R8 logic diagram.	7M
		(OR)	
10.	(a)	Draw the logic diagram for the 74×163 synchronous 4-bit binary counter including pin numbers for standard 16-pin dual in line package.	8M
	(b)	Draw the structure of a parallel in parallel out shift register.	6M

Q.P. Code: 456612

SET - 1

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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)	Define Computer? Explain different types of Computers in the market?	7M
	(b)	Define hardware? Explain in detail different types of Softwares?	7M
		(OR)	
2.	(a)	Explain Arithmetic micro operations with examples?	7M
	(b)	Explain Shift Micro Operations, Logic micro operations?	7M
		UNIT – II	
3.	(a)	Define Interrupt? Explain various types Instruction codes in detail?	7M
	(b)	Explain Computer Registers and instructions?	7M
		(OR)	
4.	(a)	Draw and explain the control memory unit?	7M
	(b)	What is an Instruction? Explain its functionalities?	7M
		UNIT – III	
5.		Explain the Differences types of Addressing Modes?	14M
		(OR)	
6.		What is a Pipelining? Explain about Arithmetic Pipeline and Instruction Pipeline? Explain in detail about data hazards?	14M
		UNIT – IV	
7.		Explain different types of Peripheral Devices? Distinguish between synchronous data transfer and asynchronous data transfer?	14M
		(OR)	
8.	(a)	What is a DMA? Explain in detail?	7M
	(b)	Explain Different types of Peripheral Devices?	7M
		UNIT-V	
9.		Explain Main memory, Auxiliary memory, Associative Memory, Cache Memory and Virtual memory?	14M
		(OR)	
10.	(a)	Define Cache Coherence? Explain Shared Memory Multiprocessors?	7M
	(b)	Explain Inter Processor Arbitration and Inter Processor Communication and Synchronization?	7M

Q.P. Code: 456812 | **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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) Derive the expression for the power radiated and find the radiation resistance of half wave dipole.
   (b) Calculate the strength of the electric field at a distance of 100Km due to a power of 100Kw radiated from an antenna of 100 meter effective height, if the wave length is 500m and absorption effects are negligible.

(OR)

2. (a) Find the radiation resistance of elementary dipole with linear current distribution.
   (b) Compute the radiation resistance, the power radiated and efficiency of antenna having total resistance of 50Ω.

UNIT – II

3. (a) Explain the radiation mechanism of binomial array with neat sketches and derive the expression for array factor.
   (b) Compare the characteristics of broad side and end fire array.

(OR)

4. (a) Discuss the broad side and end fire arrays and derive the expressions for the width of the main lobe in these cases.
   (b) A broad side array operating at 100cm wavelength consists of four half wave dipole spaced 50cm .Each element carries radio frequency current in same phase and of magnitude 0.5 Amp. Calculate:
      i. Radiated power
      ii. Half width of major lobe.

UNIT – III

5. (a) What is folded dipole antenna? Describe Yagi antenna and explain its operation.
   (b) Calculate the beam width of between first nulls of a 2.5m paraboloid reflector used at 6 GHz. What will be its gain in decibels.

(OR)

6. (a) Write short notes on the following:
      i. Helical antenna
      ii. Parasitic antenna
   (b) Estimate the diameter and effective aperture of paraboloidal reflector antenna required to produce annuls beamwidth of 10 at 3GHz.

UNIT – IV

7. (a) Explain the Earth magnetic field on Ionosphere radio wave propagation.
   (b) Classify the fading and discuss the feature of fading.

(OR)

8. (a) Write short notes on
      i. Duct Propagation.
      ii. Trophospheric scattering.
   (b) Derive the field strength equation at distance in space wave propagation.

UNIT-V

9. (a) Describe the propagation characteristics of sky wave. Relate the time varying characteristics to the composition and properties of the ionosphere.

   (b) Explain MUF and give any method of calculating .A high frequency radio link has to be established between two-points at a distance of 2500km on earth's surface. Considering the ionospheric height to be 200 km and its critical frequency 5 MHz, calculate the MUF for the given path.

(OR)

10. State and discuss the conditions of total reflection of radio waves from the ionosphere. Prove that the skip distance D for a given frequency is given by

$$D = 2h\sqrt{\left(\frac{f}{f_c}\right)^2 - 1}\,.$$

Q.P. Code: 457012 **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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)	State and prove sampling theorem in time domain	7M
	(b)	Differentiate between TDM and FDM	7M
		(OR)	
2.	(a)	Derive the expression for quantization noise of a PCM system	7M
	(b)	Why Delta modulation is superior to differential pulse code modulation	7M

UNIT – II

3.	(a)	Explain how Nyquist's Criterion eliminates interference in the absence of noise for distortion-less baseband binary transmission	7M
	(b)	What is ISI? List the various methods to remove ISI in communication system	7M
		(OR)	
4.	(a)	Write about on eye diagram	7M
	(b)	Describe the Nyquist's criteria for distortion less base band transmission	7M

UNIT – III

5.	(a)	What is entropy? State and prove its properties	7M
	(b)	State Shannon's source coding theorem and explain its implications	7M
		(OR)	
6.	(a)	Explain about Huffman coding	7M
	(b)	Explain the model of a digital communication system	7M

UNIT – IV

7.	(a)	Explain encoding procedure of Linear Block codes	7M
	(b)	Explain the procedure of Binary cyclic codes with one example.	7M
		(OR)	
8.	(a)	What are hamming codes? Discuss the error correction and detection capability of hamming code.	7M
	(b)	Compare linear block codes and cyclic codes with an example	7M

UNIT-V

9.	(a)	Describe the generation and detection of Coherent binary PSK signal	7M
	(b)	Explain the principle of DPSK encoding	7M
		(OR)	
10.	(a)	Draw and explain the coherent system of signal reception	7M
	(b)	Explain the concept of matched filter. Derive an expression for its impulse response	7M

Q.P. Code: 457212 **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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 differential input resistance of dual-input, balanced –output differential amplifier.	8(M)
	(b)	Briefly explain the concept of level translator in op –amp.	6(M)
		(OR)	
2.	(a)	Explain briefly DC characteristics of an op –amp.	10(M)
	(b)	Explain the ideal characteristics of an op-amp.	4(M)

UNIT – II

3.	(a)	Explain the basic operations of inverting & non inverting op-amp configurations along with circuit diagram.	7(M)
	(b)	Explain how op-amp can perform addition and subtraction operations simultaneously with suitable circuit.	7(M)
		(OR)	
4.	(a)	Draw the circuit of op-amp instrumentation amplifier and explain with suitable equations.	7(M)
	(b)	Draw and explain the operator of an op-amp AC voltage follower.	7(M)

UNIT – III

5.	(a)	Draw the circuit of zero crossing detectors and explain its working with relevant wave forms.	7(M)
	(b)	With neat circuit diagram, Explain the operation of triangle wave generator with suitable wave forms & equations.	7(M)
		(OR)	
6.	(a)	Explain the operation of op-amp first order low pass filter along with frequency response and design steps with neat circuit diagram.	7(M)
	(b)	With neat schematic, explain band pass filter using op-amp with suitable wave forms and equations.	7(M)

UNIT – IV

7.	(a)	With suitable equations & neat sketch explain RC phase shift oscillator using op – amp.	7(M)
	(b)	Explain the operation of a astable multivibrator using 555 timer.	7(M)
		(OR)	
8.	(a)	Discuss how 555 timers can be operated in astable mode with suitable circuits and equations.	8(M)
	(b)	Explain the operation of a VCO.	6(M)

UNIT-V

9.	(a)	With necessary circuit diagram and equations, explain weighted resister DAC.	8(M)
	(b)	What output voltage would be produced by a DAC whose output range is 0 to 10 V and whose input binary number is i) 0110 (for 4 bit DAC) ii) 10 (for a 2 bit DAC) iii) 10111100 (for a 8 bit DAC)	6(M)
		(OR)	
10.	(a)	Explain briefly the following with neat diagrams i) Basic DAC Technique ii) Function diagram of ADC	7(M)
	(b)	With neat sketch, explain flash type ADC.	7(M)

Q.P. Code: 457412 **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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 Register structure of 8085 microprocessor?	8M
	(b)	Write a program to add two numbers using direct addressing mode and rewrite same program with indirect addressing mode.	6M
		(OR)	
2.	(a)	Draw the Timing Diagram of MVI A,55h	8M
	(b)	Describe the interrupt structure of 8085.	6M

UNIT – II

3.	(a)	Identify the addressing modes which are common in 8085 and 8086 processors? Explain them with examples.	8M
	(b)	Explain how 16 bit IP is used to access instructions from 20 bit address memory.	6M
		(OR)	
4.	(a)	Explain maximum mode signals and the significance of Maximum Mode.	6M
	(b)	Explain flowing instructions of 8086 i) DAA ii) AAA iii) XCHG iv) CBW	8M

UNIT – III

5.	(a)	Write an ALP to implement Bubble Sorting algorithm and explain the process.	8M
	(b)	Write an ALP to find maximum no from 3 numbers	6M
		(OR)	
6.	(a)	Write an ALP to reverse a given string.	8M
	(b)	Write an ALP to transfer a string from one block to another block	6M

UNIT – IV

7.	(a)	Explain various data transfer techniques?	8M
	(b)	Explain different operating modes of 8254 Timer.	6M
		(OR)	
8.	(a)	Explain programming of 8251 Mode and Control words?	8M
	(b)	Draw the Block diagram of 8259 interrupt controller and describe the operation	6M

UNIT-V

9.	(a)	Write a ALP to generate Sawtooth waveform from a DAC connected to 8086 processor	6M
	(b)	Interface 4K ROM and 4K RAM to 8086 processor. Assume suitable addresses ranges	8M
		(OR)	
10.	(a)	Draw the interfacing diagram of stepper motor connected 8255 ports. Write an ALP rotate the stepper motor in clockwise direction continuously. Step angle=1 0	8M
	(b)	Draw the interfacing diagram of controlling a 230V lamp with 8255 and a relay.	6M

Q.P. Code: 556412 **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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) What are factors affecting plant location? Explain. 7M
   (b) Explain types of production 7M

(OR)

2. (a) List the objectives of plant Layout 7M
   (b) Explain principles of material handling. 7M

UNIT – II

3. (a) Explain method study procedure. 7M
   (b) Explain string diagram used in method study. 7M

(OR)

4. (a) Explain motion economy principles. 7M
   (b) Explain man-machine chart used in method study 7M

UNIT – III

5. (a) Explain at least three performance rating methods 7M
   (b) What are the equipment used in time study. 7M

(OR)

6. (a) Explain steps involved in work sampling for calculation of standard time. 7M
   (b) A work sampling study was made of a cargo-loading operation for the purpose of developing a standard time. During the total 120 minutes of observation the employee was working 80% of the time and loaded 60 pieces of cargo. The analyst rated the performance at 90%. The firm wishes to incorporate an allowance factor for fatigue, delays, and personal time of 10% of normal time. What is the standard time for this operation in minutes per piece? 7M

UNIT – IV

7. (a) What is difference between PERT and CPM. 7M
   (b) Given that a project involves following activities each requiring completion, in days, as per the following table: 7M

Activity	A	B	C	D	E	F	G	H	I
TIME	23	8	20	16	24	18	19	4	10

Given that A precedes activities D and E; activities B and D precede activity F; activity C precedes activity; activities B and G precedes H, and activities F and G precede activity I, draw the network and calculate:
(i) Total float (ii) Free float (iii) Critical path and (iv) Project completion time.

(OR)

8. The following table gives data on normal time and cost and crash and cost for a project. 14M

Activity	Duration(Weeks)		Total cost(Rs)	
	Normal	Crash	Normal	Crash
1-2	3	2	300	450
2-3	3	3	75	75
2-4	5	3	200	300
2-5	4	4	120	120
3-4	4	1	100	190
4-6	3	2	90	130
5-6	3	1	60	110

(i) Draw the network and find out the critical and the normal project duration.
(ii) Find out the Total float associated with each activity
(iii) If the indirect costs are Rs 100 per week, find out duration by crashing and the corresponding project costs.

UNIT-V

9. (a) What is variation? Explain types of variation. 7M
(b) Explain construction of X bar and R charts. 7M

(OR)

10. (a) What are the attributes? Explain difference between defects and defective. 7M
(b) The following are the inspection results of 20 lots of magnets, each lot having 750 magnets . Number of defective magnets in each lot are 48,83,70,85,45,56,48,67,37,52,47,50,47,57,51,71,53,34,29 and 30. Calculate the average fraction defective and three sigma control limits for pchart. 7M

Q.P. Code: 556612

SET - 1

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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) What are the four basic components of a steam power plant? Write their functions in brief. 4M

   (b) A steam power plant operates on an ideal Rankine cycle between a boiler pressure of 40 bar, 300^0C and a condenser pressure of 0.035 bar. Calculate cycle efficiency, work ratio and specific steam consumption for (i) Ideal Rankine cycle (ii) For Rankine cycle, when expansion process has an isentropic efficiency of 80%. 10M

(OR)

2. (a) Represent the Rankine cycle on P-V and T-S diagram and explain briefly. 4M

   (b) Steam is supplied to a turbine at 30 bar and 350^0C. The turbine exhaust pressure is 0.08 bar. The main condensate is heated regeneratively in two stages by steam bleed from the turbine at 5 bar and 0.1 bar respectively. Calculate masses of steam bleed off at each pressure per kg of steam entering the turbine and theoretical thermal efficiency of the cycle. 10M

UNIT – II

3. (a) Explain with a neat sketch the construction and working of a Babcock & Wilcox Boiler. 7M

   (b) Discuss various types of boiler accessories and explain any one of them with a neat sketch. 7M

(OR)

4. A 40 m height chimney is discharging flue gases at 350^0C, when the ambient temperature is 30^0C. The quantity of air supplied is 18 kg of flue burnt. Determine (i) draught produced in mm of water, (ii) equivalent draught in meters of hot-gas column, (iii) efficiency of the chimney if minimum temperature of artificial draught is 150^0C: the mean specific heat of flue gases is 1.005 kJ/kgK, (iv) the percentage of the heat spent in natural draught system, if the net calorific value of the fuel supplied be 30600 kJ/kg, (v) the temperature of chimney gases for maximum discharge in a given time and what would be the corresponding draught in mm of water produced. 14M

UNIT – III

5. Dry saturated steam at a pressure of 11 bar enters a convergent divergent nozzle and leaves at a pressure of 0.2 bar. If the flow is friction less and adiabatic, determine: (i) the exit velocity of steam, (ii) ratio of cross section at exit and that at throat. Assume the index of adiabatic expansion to be 1.135. 14M

(OR)

6. (a) 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

   (b) Dry saturated steam at 6.5 bar with negligible velocity expands isentropically in a convergent nozzle to 1.4 bar and the dryness fraction is 0.956. Determine the velocity of steam leaving the nozzle. If 13% heat is lost in friction, find the percentage reduction in the final velocity. 7M

UNIT – IV

7. (a) Illustrate the differences between Impulse turbine and a Reaction turbine. 7M

   (b) Single stage impulse turbine has equal blade angles and nozzle angle of 15°. Determine the maximum possible blade efficiency if the blade velocity coefficient is 0.85. Determine the blade speed to steam velocity ratio if the actual blade efficiency is 90% of maximum blade efficiency. 7M

(OR)

8. In a reaction turbine, the blade tips are inclined at 35^0 and 20^0 in the directions of motions. The guide blades are of the same shape as that of the moving blades but reversed in direction. At a certain place in the turbine, the drum diameter is 1 meter and the blades are 10 cm high. At this place, the steam has a pressure of 1.75 bar and 0.935 dry. If the speed of the turbine is 2500 rpm and the steam passes through the blades without shock, find the mass of steam flow and power developed in the ring of the moving blades. 14M

UNIT-V

9. (a) How do you classify condensers? Discuss the merits and demerits of jet condensers over surface condensers 8M

   (b) Steam enters a condenser at 36^0C and with barometer reading 760 mm. If the vacuum of 695 mm is produced find the vacuum efficiency. 6M

(OR)

10. (a) Discuss the effects of air leakage in a condenser. 6M

    (b) Classify cooling towers and state the factors affecting cooling of water in a cooling tower 8M

Q.P. Code: 556812 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018
SUB: DYNAMICS OF MACHINERY-I (ME)

Time: 3 Hours | Max. Marks: 70

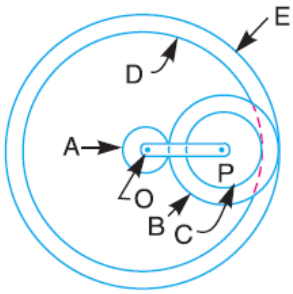
Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. In an epicyclic gear train, the internal wheels A and B and compound wheels C and D rotate independently about axis O. The wheels E and F rotate on pins fixed to the arm G. E gears with A and C and F gears with B and D. All the wheels have the same module and the number of teeth are: $T_C = 28$; $T_D = 26$; $T_E = T_F = 18$. 14M
   1. Sketch the arrangement; 2. Find the number of teeth on A and B; 3. If the arm G makes 100 r.p.m. clockwise and A is fixed, find the speed of B; and 4. If the arm G makes 100 r.p.m. clockwise and wheel A makes 10 r.p.m. counter clockwise ; find the speed of wheel B.

(OR)

2. The figure shows diagrammatically a compound epicyclic gear train. Wheels A, D and E are free to rotate independently on spindle O, while B and C are compound and rotate together on spindle P, on the end of arm OP. All the teeth on different wheels have the same module. A has 12 teeth, B has 30 teeth and C has 14 teeth cut externally. Find the number of teeth on wheels D and E which are cut internally. If the wheel A is driven clockwise at 1 r.p.s. while D is driven counter clockwise at 5 r.p.s., determine the magnitude and direction of the angular velocities of arm OP and wheel E. 14M



UNIT – II

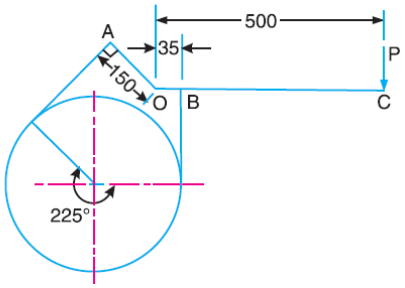
3. The following data relate to a flat belt drive: 14M
   Power transmitted = 18kW; Pulley diameter = 180cm; angle of contact = 175^0; speed of pulley = 300rpm; coefficient of friction between belt and pulley surface = 0.3; permissible stress for belt = $300N/cm^2$; thickness of belt = 8mm; density of belt material = $0.95x10^{-3}$ gr/cc.
   Determine the width of the belt required taking centrifugal tension into account.

(OR)

4. Explain the working of a centrifugal clutch with help of a neat sketch. 14M

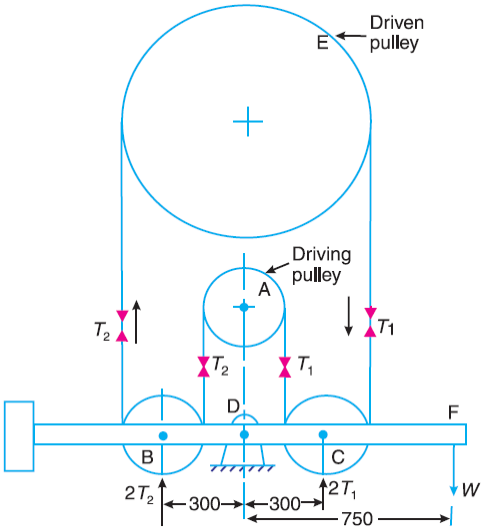
UNIT – III

5. (a) Distinguish between brakes and dynamometers. 4M
   (b) A differential band brake, as shown in fig., has an angle of contact of 225°. The band has a compressed woven lining and bears against a cast iron drum of 350 mm diameter. The brake is to sustain a torque of 350 N-m and the coefficient of friction between the band and the drum is 0.3. Find the necessary force (P) for the clockwise and anticlockwise rotation of the drum. 10M



(OR)

6. The essential features of a transmission dynamometer are shown in figure. A is the driving pulley which runs at 600 r.p.m. B and C are jockey pulleys mounted on a horizontal beam pivoted at D, about which point the complete beam is balanced when at rest. E is the driven pulley and all portions of the belt between the pulleys are vertical. A, B and C are each 300mm diameter and the thickness and weight of the belt are neglected. The length DF is 750 mm. Find: **1.** the value of the weight W to maintain the beam in a horizontal position when 4.5 kW is being transmitted, and **2.** the value of W, when the belt just begins to slip on pulley A. The coefficient of friction being 0.2 and maximum tension in the belt 1.5 kN. 14M



UNIT – IV

7. A certain machine requires a torque of (2000+300sinθ) N-m to drive it, where θ is the angle of rotation of its shaft measured from some datum. The machine is directly coupled to an electric motor developing uniform torque. The mean speed of the machine is 200rpm. Find: 14M
i). The power of the driving electric motor, and
ii). Moment of inertia of the flywheel required to be used if the fluctuation of speed is limited to ±2%.

(OR)

8. The turning moment diagram of a four stroke engine may be assumed for the sake of simplicity to be represented by four triangles in each stroke. The areas of these triangles are as follows: 14M
Suction stroke = 5×10^{-5} m^2; Compression stroke = 21×10^{-5} m^2; Expansion stroke = 85×10^{-5} m^2; Exhaust stroke = 8×10^{-5} m^2.
All the areas excepting expression stroke are negative. Each m^2 of area represents 14 MN-m of work. Assuming the resisting torque to be constant, determine the moment of inertia of the flywheel to keep the speed between 98r.p.m. and 102 r.p.m. Also find the size of a rim-type flywheel based on the minimum material criterion, given that density of flywheel material is 8150kg/m^3; the allowable tensile stress of the flywheel material is 7.5 MPa. The rim cross-section is rectangular, one side being four times the length of the other.

UNIT-V

9. A Proell governor has equal arms of length 300 mm. The upper and lower ends of the arms are pivoted on the axis of the governor. The extension arms of the lower links are each 80 mm long and parallel to the axis when the radii of rotation of the balls are 150 mm and 200 mm. The mass of each ball is 10kg and the mass of the central load is 100 kg. Determine the range of speed of the governor. 14M

(OR)

10. (a) Define the following terms relating to governor: 6M
i). Stability ii). Isochronism iii). Hunting
(b) Derive an expression for height of a Watt's governor. 8M

Q.P. Code: 557012 **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018
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. List out the operations performed on a lathe and explain any four operations with a neat sketch. 14M

(OR)

2. (a) Explain with a neat sketch, the working of an engine lathe? 8M
   (b) Explain the basic elements of any machining operation? 6M

UNIT – II

3. (a) Define cutting speed, Feed, Depth of cut in a Shaper? 6M
   (b) Explain with a neat sketch, the working of a Slotter? 8M

(OR)

4. (a) Explain the working principle of planer with a neat sketch 4M
   (b) Describe with neat sketches the important accessories used in lathe machine? 10M

UNIT – III

5. (a) What is the importance specification of a twist drill? 7M
   (b) Explain the operations of boring, reaming and tapping? 7M

(OR)

6. What is a twist drill? With a neat sketch explain the principal parts of a twist drill. 14M

UNIT – IV

7. Name and describe the principal parts of a horizontal milling machine with a neat sketch? 14M

(OR)

8. Explain the working mechanism of universal dividing head with a neat sketch? 14M

UNIT-V

9. (a) What do you understand by a silicate bond? 7M
   (b) Write short notes on wheel truing and wheel dressing 7M

(OR)

10. (a) How is grinding classified ? Explain with a neat sketch plane cylindrical grinder? 8M
    (b) Differentiate between lapping and honing. 6M

Q.P. Code: 557212 **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

SUB: DESIGN OF MACHINE ELEMENTS-I (ME)

Time : 3 Hours Max. Marks: 70

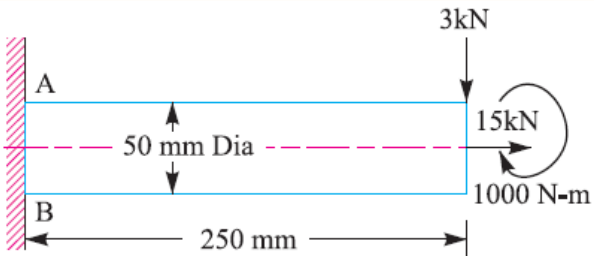
Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Explain the design process with a flow chart? 7 M
   (b) Briefly explain the properties of engineering materials? 7 M

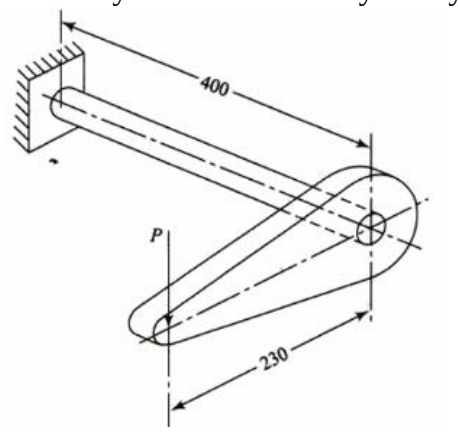
(OR)

2. A shaft, as shown in figure is subjected to a bending load of 3 kN, pure torque of 1000 N-m and an axial pulling force of 15 kN. Calculate the stresses at A and B? 14M



UNIT – II

3. (a) A cylindrical shaft of outer diameter double the inner diameter is subjected to bending moment of 15000 N. m and twisting moment of 25000 N. m. Determine the dimensions of the shaft using a factor of safety 2. The material is made of steel with shear strength of 350 MPa? 6 M
   (b) The diameter of the shaft as shown in figure is 60 mm. The shaft is made of steel having tensile yield strength of 400 MPa and factor of safety 2.5. Find the load P using Maximum shear stress theory and Mises Hencky theory? 8 M



(OR)

4. (a) Explain the methods to reduce the stress concentration? 4 M
   (b) Hot rolled 070M 26 steel is to be subjected to a torsional load that will vary from -110 N. m to 440 N. m. Determine the required diameter of the rod using factor of safety of 1.75. Take σ_{eb} =230 MPa, τ_y =186 MPa. The endurance limit correction factor for torsional loading is 0.6, for size is 0.85, for material is 0.68 and K_f =1? 10M

UNIT – III

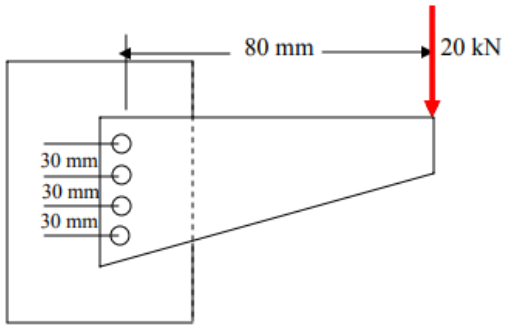
5. (a) Explain the advantages and disadvantages of welded joints over riveted joints? 6 M

(b) Derive the relations for strength of parallel and transverse fillet welds? 8 M

(OR)

6. (a) An eye bolt is to be used for lifting a load of 60 kN. Find the nominal diameter of the bolt, if the tensile stress is not to exceed 100 MPa. Assume coarse threads? 4 M

(b) A bracket is supported by means of 4 rivets of same size as shown in figure. Determine the diameter of the rivet if the maximum shear stress is 140 MPa? 10M



UNIT – IV

7. A shaft, supported by two bearings 800 mm apart, transmits 600 kW at 1000 rpm. A vertical load of 400 N acts at the mid-span of the shaft. Design the shaft for the following permissible values 14M

Case i Permissible stress= 40 MPa

Case ii Permissible lateral deflection = 0.025 mm

Case iii Permissible angular deflection = 1^{o} for every 15 diameters

(OR)

8. A hollow steel shaft is to transmit 20 kW at 300 rpm. The loading is such that the maximum bending moment is 1000 N-m, the maximum torsional moment is 500 N-m and axial compressive load is 15 kN. The shaft is supported on rigid bearings 1.5 m apart. The maximum permissible shear stress on the shaft is 40 MPa. The inside diameter is 0.8 times the outside diameter. The load is cyclic in nature and applied with shocks. The values for the shock factors are $K_t = 1.5$ and $K_m = 1.6$? 14M

UNIT-V

9. Two mild steel rods are connected by a knuckle joint to transmit an axial force of 100 kN. Design the joint completely assuming the working stresses for both the pin and rod materials to be 100 MPa in tension, 65 MPa in shear and 150 MPa in crushing? 14M

(OR)

10. (a) Design a rigid muff coupling used to transmit 25 kW power at 300 rpm. The shear stress for shaft material is 165 MPa with a factor of safety of 4. The muff is made of cast iron having an allowable shear stress of 16.7 MPa? 8M

(b) A flange coupling is used to transmit 50 kW at 1000 rpm. Find the diameter of the bolt, if 6 bolts are mounted at 200 mm bolt pitch circle diameter. Take allowable shear stress for bolt material is 30 MPa? 6M

Q.P. Code: 557412 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018
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. Derive the 1-D steady state heat conduction equation for a slab with internal heat generation 14M

(OR)

2. A steel pipe of 50 mm OD is covered with two layers of insulation. The Inner layer is 7.5 mm thick and has a thermal conductivity of 0.3 W/mk and the top layer is 25 mm thick and K= 0.12 W/mk. The pipe wall is 315^0C and outside air temperature is 25^0 C. The convective heat transfer coefficient is 16 W/m^2-K. Determine the surface temperature and heat loss per meter length. 14M

UNIT – II

3. A long carbon steel rod of length 40 cm and diameter 10 mm (K = 40 W/mK) is placed in such a way that one of its end is at 400^0C and the ambient temperature is 30^0C. The film coefficient is 10 W/m^2K. Determine: (i) Temperature at mid length of the fin. (ii) Fin efficiency (iii) Heat transfer rate from the fin. 14M

(OR)

4. What is lumped mass model? Derive the equation for temperature distribution in transient condition of a material with negligible internal resistance. 14M

UNIT – III

5. Explain the following:
   (i) View factor 4M
   (ii) Kirchoff's law 3M
   (iii) Wein's displacement law 4M
   (iv) Stefan-Boltzmann's law 3M

(OR)

6. Consider two large diffuse, gray parallel surfaces separated by a small distance. If the surface emissivities are 0.8 and 0.65 respectively; surface temperatures are 600 K and 450 K. What is the radiation heat exchange between the two surfaces? If they are separated by a radiation shield of emissivity 0.25, what is the percentage reduction in heat transfer? 14M

UNIT – IV

7. Explain the concept of boundary layer theory for forced convection flow through a circular pipe. 14M

(OR)

8. Glycerin at 30^0C with a flow rate of 0.01 kg/s enters a 2cm ID tube which is maintained at uniform temperature of 80^0C. Determine: (i) The thermal entry length (ii) Assuming hydro-dynamically and thermally developed flow, determine the heat transfer coefficient and tube length required to heat the glycerin to 50^0C. 14M

UNIT-V

9. (a) What is the effect of presence of non-condensable gases on the condensation process? Explain. 6M
   (b) Explain the concept of LMTD for a counter flow heat exchanger 8M

(OR)

10. A counter flow heat exchanger is used to cool oil at a rate of 0.6 kg/s (C_p=2.5 KJ/kg-K) from 110^0C to 35^0C using water at 20^0C. The overall heat transfer coefficient is 1500 Wm^2K. Assuming cooling water outlet temperature as 80^0C and using NTU method calculate: (i) Water flow rate (ii) Surface area required (iii) Effectiveness of heat exchanger. 14M

Q.P. Code: 656412 **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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 the architecture of 8086 microprocessor with a neat diagram.	7M
	(b)	Name and explain any seven addressing modes used in 8086 using suitable examples.	7M
		(OR)	
2.	(a)	Explain about flag register of 8086.	7M
	(b)	Draw and explain the memory read & write machine cycle in maximum mode.	7M
		UNIT – II	
3.	(a)	Write an ALP to find Factorial of given number using CALL and RET instructions	7M
	(b)	Write an ALP to find sum & average value from the given array of a 10 numbers?	7M
		(OR)	
4.	(a)	Explain about different stages of software development.	7M
	(b)	Write an ALP to find out a smallest number from an array of 10 numbers?	7M
		UNIT – III	
5.	(a)	Draw the internal block diagram of 8259 and explain about each block.	7M
	(b)	Explain about ICWs and OCWs in 8259	7M
		(OR)	
6.	(a)	Distinguish between asynchronous and synchronous data transfer schemes.	7M
	(b)	Draw the block diagram of 8251 and explain each block.	7M
		UNIT – IV	
7.		Explain interfacing of Traffic light controller to 8086 microprocessor with neat diagram.	14M
		(OR)	
8.		With neat diagram explain about interfacing of ADC to microprocessor.	14M
		UNIT-V	
9.	(a)	Explain the different modes of operation.	7M
	(b)	List the salient features and general purpose registers of 80486	7M
		(OR)	
10.	(a)	Explain about special Pentium registers.	7M
	(b)	Explain about Pentium Memory management.	7M

Q.P. Code: 656612 **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018
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.	(a)	Explain five Generations of Electronic Computers in detail.	7 M
	(b)	Explain in detail about Distributed Memory Multicomputer.	7 M
		(OR)	
2.		Explain in detail about i) Static Connection Networks ii) Dynamic connection networks	14M

UNIT – II

3.	(a)	Explain Amdahl's Law for a fixed workload	7M
	(b)	Explain Gustafson's Law for Scaled Problems.	7M
		(OR)	
4.		Explain in detail about Message-passing mechanisms.	14M

UNIT – III

5.	(a)	Describe Synchronized MIMD Machine	7 M
	(b)	Write a note on CM-5 Network Architecture.	
		(OR)	
6.		Explain in detail about Multivector Multiprocessors.	14M

UNIT – IV

7.	(a)	With a neat sketch explain the J-Machine Architecture.	7 M
	(b)	Write a short note on Caltech Mosaic C .	7 M
		(OR)	
8.		Explain data flow and hybrid architectures in detail.	14M

UNIT-V

9.		Explain various parallel programming models with an example for each.	14M
		(OR)	
10.	(a)	Explain various principles of synchronization in detail.	7 M
	(b)	Write a short note on semaphores and applications	7 M

Q.P. Code: 656812 **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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)	Distinguish Pass and Phase. Compare single pass and multi pass compiler.	4M
	(b)	With appropriate example explain various phases of compiler.	10M
		(OR)	
2.	(a)	Explain LEX tool and write a LEX program to identify tokens like identifiers, numbers and keywords.	8M
	(b)	What is input buffering? Explain with suitable example.	6M

UNIT – II

3.	(a)	Explain about Operator Precedence Parsing with example.	8M
	(b)	Explain about the Recursive Descent Parsing.	6M
		(OR)	
4.	(a)	Validate whether the following grammar is SLR or not. Justify. $E \Rightarrow E - T \mid T$ $T \Rightarrow F \mid *f$ $F \Rightarrow i \mid (E)$	10M
	(b)	Bottom up parsing is more powerful than Top down parsing. Justify.	4M

UNIT – III

5.	(a)	What is Syntax Directed Translation? Write Syntax Directed Definition for type statement.	7M
	(b)	Explain the procedure for converting L- attributed to S-attributed definition.	7M
		(OR)	
6.	(a)	What is Type Expression? Write type expressions for the following i. A two dimensional array integers (i.e. an array of arrays) whose rows are indexed from 0 to 9 and whose columns are indexed from -10 to 10. ii. Functions and records.	8M
	(b)	Explain about Type conversion.	6M

UNIT – IV

7.	(a)	What is activation record? Explain the use of activation records in dynamic storage allocation.	7M
	(b)	What is self-organizing list? Explain how the symbol table organizes self-organizing lists for block structured language.	7M
		(OR)	
8.	(a)	Give the significance of intermediate code representation. Write three address code for the expression a=b*-(c-d)+ a=b*-(c-d).	7M
	(b)	List and explain the basic reasons why stack allocation strategy cannot be used for activation records.	7M

UNIT-V

9.	(a)	Explain about different Object code forms.	6M
	(b)	Explain various techniques for Register allocation and assignment.	8M
		(OR)	
10.		Explain the principles sources of optimization with suitable examples.	14M

Q.P. Code: 657012 **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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 Software engineering? Explain about Software the nature of software.	7M
	(b)	Explain Software Myths.	7M
		(OR)	
2.		Define Process model and Explain various Prescriptive Process Models.	14M
		UNIT – II	
3.	(a)	What is Requirements Engineering and Explain Establishing the Groundwork.	7M
	(b)	Explain Scenario-Based Modeling	7M
		(OR)	
4.		Explain briefly Class-Based Modeling.	14M
		UNIT – III	
5.		What is component and Explain Design Concepts.	14M
		(OR)	
6.		Explain briefly Architectural Styles.	14M
		UNIT – IV	
7.	(a)	Explain the Golden Rules.	7M
	(b)	Explain Interface Design Steps.	7M
		(OR)	
8.	(a)	What is Debugging? And Explain Program Analysis Tools	7M
	(b)	Define Black-Box Testing, White-Box Testing and an simple example for graph based testing method.	7M
		UNIT-V	
9.	(a)	What are the Responsibilities of a Software Project Manager?	7M
	(b)	Explain Characteristics of Software Maintenance.	7M
		(OR)	
10.	(a)	Explain Metrics for Project Size Estimation.	7M
	(b)	Explain Project Estimation Techniques.	7M

Q.P. Code: 657212 **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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)	What are the three criteria necessary for an effective and efficient network?	**4M**
	(b)	Explain the functions of various layers in ISO-OSI reference model.	**10M**
		(OR)	
2.	(a)	Explain the Comparison of OSI & TCP/IP reference models?	**7M**
	(b)	Explain various types of networks?	**7M**

UNIT – II

3.		Describe and discuss the data link layer design issues.?	**14M**
		(OR)	
4.	(a)	Explain in detail about Carrier Sense Multiple access protocol?	**10M**
	(b)	Explain about Wireless LAN Protocols	**7M**

UNIT – III

5.		What is meant by principle of optimality and Explain any three Routing algorithms with an example?	**14M**
		(OR)	
6.		Explain about various types of Congestion control Algorithms?	**14M**

UNIT – IV

7.		Explain various Elements of transport Protocols?	**14M**
		(OR)	
8.		Explain in detail about The Internet Transport protocol TCP?	**14M**

UNIT-V

9.		Write about World Wide Web?	**14M**
		(OR)	
10.		Write about Domain Name System?	**14M**

Q.P. Code: 657412 | **SET - 1**

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

B. Tech. V Sem. (R15) Regular & Supple. Examinations of November 2018

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 XAMPP	2M
	(b)	Explain the installation process of XAMPP	12M
		(OR)	
2.	(a)	Write short notes on IIS web server	7M
	(b)	Explain HTTP requests & HTTP responses	7M
		UNIT – II	
3.	(a)	List and explain types of list each with an example	6M
	(b)	Explain the form tag elements with an example	8M
		(OR)	
4.	(a)	What is CSS?	2M
	(b)	Explain how to create objects in Java Script with an example	12M
		UNIT – III	
5.	(a)	Explain about PHP Expressions and control statements in detail	7M
	(b)	Explain about PHP strings in detail	7M
		(OR)	
6.	(a)	How to define a class in PHP? Explain in detail about classes	8M
	(b)	How to create instances using constructors with an example	6M
		UNIT – IV	
7.	(a)	Explain the process of creating cookies with an example	7M
	(b)	Explain about Environment variables with an example	7M
		(OR)	
8.	(a)	Explain briefly how to redirect the HTTP headers to different locations	7M
	(b)	Explain the process of authenticating users	7M
		UNIT-V	
9.	(a)	Explain briefly about the POST method with example	7M
	(b)	How to validate form input explain it with an example	7M
		(OR)	
10.	(a)	Explain the following functions with examples i) mysql_connect() ii) mysql_close() iii) mysql_query() iv) mysql_select_db()	8M
	(b)	How to update and delete data from a database	6M