Q.P. Code: 1801501 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
SUB: Solid Mechanics - 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. The stresses at a point in a bar are 180 N/mm^2 (Tensile) and 90 N/mm^2 (Compressive). Determine the resultant stress in magnitude and direction on a plane inclined at 60^0 to the axis of the major stress. Also determine the maximum intensity of shear stress in the material at the point. **14M**

(OR)

2. A Cylindrical shell made of mild steel plate and 1.2m in diameter is to be subjected to an internal pressure of 1.5 KN/mm^2. If the material yields at 220 KN/mm^2, Calculate the thickness of the plate on the basis of the following three theories, Assuming a factor of safety is 3 in each case: **14M**
   i. Maximum principal stress theory
   ii. Maximum shear stress theory
   iii. Maximum shear strain energy theory

UNIT – II

3. A Cylindrical shell 3 m long which is closed at the ends has an internal diameter of 1 m and a wall thickness of 15 mm. Calculate the circumferential and longitudinal stresses induced and also change in the dimensions of the shell if it is subjected to an internal pressure1.5 MN/m^2. Take E = 200 GN/m^2, and 1/m = 0.3 **14M**

(OR)

4. Derive the equations for Lame's theory.

UNIT – III

5. Derive the Prof. Perry's formula for columns under eccentric loading. **14M**

(OR)

6. A Square column of wood is 2.5m long with pinned ends. Taking a factor of safety of 2.5 in computing Euler critical load and also taking the allowable compressive stress as 12 N/mm^2, find the size of the cross section, if the column has to safety support (i) 180 KN (ii) 325 KN. Take E = 1.3 X 10^4 N/mm^2. **14M**

UNIT – IV

7. What is the limit of eccentricity for a rectangular section? Prove the limit of eccentricity is less than one sixth of its dimensions of the section. **14M**

(OR)

8. A Short column of hollow cylindrical section 25 cm outside diameter and 15 cm inside diameter carries a vertical load of 400 KN along one of the diameter planes 10 cm away from the axis of the column. Find the extreme intensities of stresses and state their nature. **14M**

UNIT-V

9. Find the centroidal principal moments of inertia of a equal angle section 30 x 30 x 8 mm. **14M**

(OR)

10. Find the position of principal axes and the values of the principal moments of inertia for an unequal angle 75 x 45 x 7.5 mm. **14M**

Q.P. Code: 1801502 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
SUB: Hydraulics Machinery (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 25 mm diameter water jet exerts a force of 883 N in the direction of flow on a flat plate which is held inclined at an angle of 30^0 with the axis of stream. Find the rate of flow of water. 14M

(OR)

2. Derive an expression for the efficiency when a water jet strikes a series of flat plates. Also show that the efficiency can never exceed 50%. 14M

UNIT – II

3. What do you mean by hydraulic turbines? How will you classify these turbines? 14M

(OR)

4. Explain the construction and working of a Pelton turbine with a neat diagram. 14M

UNIT – III

5. Define the terms unit speed, unit discharge and unit power for a hydraulic turbine. Also derive expressions for each of them. 14M

(OR)

6. A turbine is to operate under a head of 30 m at 190 rpm and the discharge is 8 m^3/s. If the efficiency is 85%, then determine 14M
   (i) The power generated
   (ii) Specific speed of the turbine
   (iii) Type of turbine
   (iv) The performance of turbine under a head of 20 m

UNIT – IV

7. Describe the principle, constructional and working details of a centrifugal pump. 14M

(OR)

8. A centrifugal pump is to discharge 0.118 m^3/s at a speed of 1450 rpm against a head of 25 m. The impeller diameter is 250 mm, its width at the outlet is 50 mm and manometric efficiency is 75%. Determine the vane angle at the outer periphery of the impeller. 14M

UNIT-V

9. The diameter and stroke of single acting reciprocating pump are 0.15 m and 0.35 m, respectively. Both the suction and delivery pipes are 0.1 m in diameter. The lengths of the suction and delivery pipes are 5 m and 30 m, respectively. The centre of the pump is 4 m above the water surface in the sump and 25 m below the delivery water level. If the pump is working at 30 rpm and atmospheric pressure is 76 cm of mercury, then find 14M
   (i) The pressure heads on the piston at the beginning, middle and end of the suction stroke
   (ii) Pressure heads on the piston at the beginning, middle and end of the delivery stroke and
   (iii) Power required to run the pump.

(OR)

10. Describe with the aid of neat sketch the working of a hydraulic accumulator. Also obtain an expression for the capacity of a hydraulic accumulator. 14M

Q.P. Code: 1801503 | **SET - 1**

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

B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021

SUB: Structural Analysis – I (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 fixed bam of length 7m carries a point load of 125kN at the mid-point and a uniformly distributed load throughout the span of the beam .Find the fixed end moments and the reaction at the supports. Draw B.M and S.F diagrams. 14M

(OR)

2. Find the fixed end moments and support reactions of a fixed beam of length 8m carrying a uniformly distributed load in the middle 4m span. 14M

UNIT – II

3. A continuous beam consists of three spans each of 5m. First span carries a load of 4 kN/m, second span carries a concentrated load of 50 kN in the mid-point and the third span carries a load of 5 kN/m. Draw BMD and SFD for the beam. Find the support moments and plot the S.F and B.M diagram by **Clayperon's theorem**. 14M

(OR)

4. A continuous beam ABC is built-in at A and C and is carried over simple roller support at B. Span AB = 7 m and span BC = 6 m. It carries a uniformly distributed load of 25 kN/m over the span AB and a uniformly distributed load of 20 kN/m acting in the span BC. The middle support B sinks by 5 mm with respect to supports A and C. Find the moments and reactions at all the supports and draw the bending moment and shear force diagrams using **Clapeyorn's theorem** of three moments. Assume E = 2.1 × 10^5 MPa and I = 2.3 x 10^{-3} m^4. 14M

5. Analyse the continuous beam loaded as shown in Fig.1 by the slope-deflection method and draw the bending moment diagram. Given: $2I_{AB} = I_{BC} = 2I_{CD} = 2I$ 14M

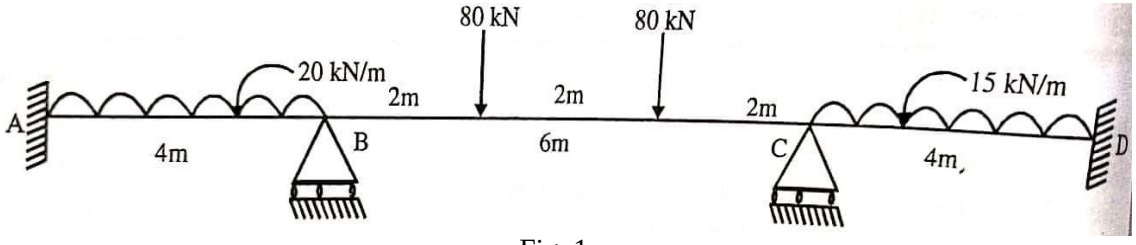

Fig. 1

(OR)

6. Analyse the continuous beam loaded as shown in Fig. 2, by the slope-deflection method. Support B sinks by 8mm. Take E = 200 GPa, I = 9 x 10^8 mm^4. Draw the bending moment and shear force diagrams. 14M

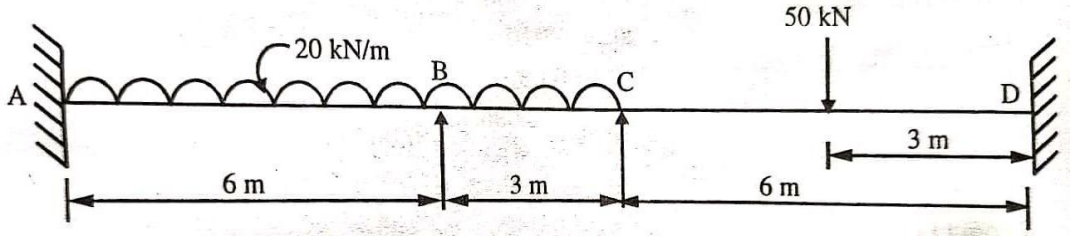

Fig. 2

UNIT – IV

7. Analyse the continuous beam shown in Fig. 3 by the moment distribution method. 14M

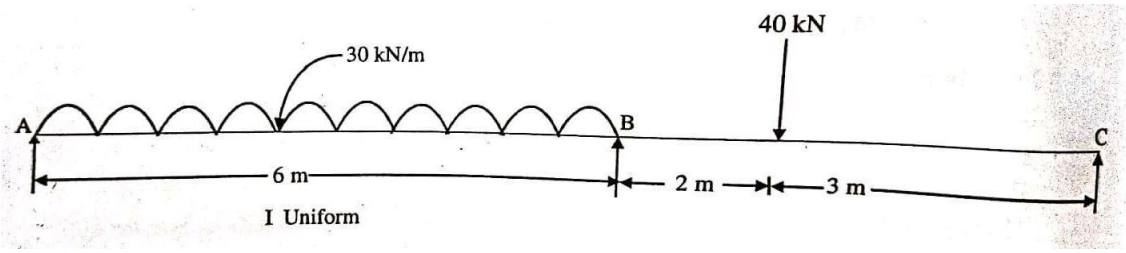

Fig. 3

(OR)

8. A continuous beam ABCD, 20m long in simply supported at its ends and is propped at the same level at B and C as shown in Fig. 4. If support B is sinks by 10mm, analyse the beam by moment distribution method and draw the bending moment diagram. Take E = 2.1 x 10^5 N/mm^2 and I = 85 x 10^5 mm^4. 14M

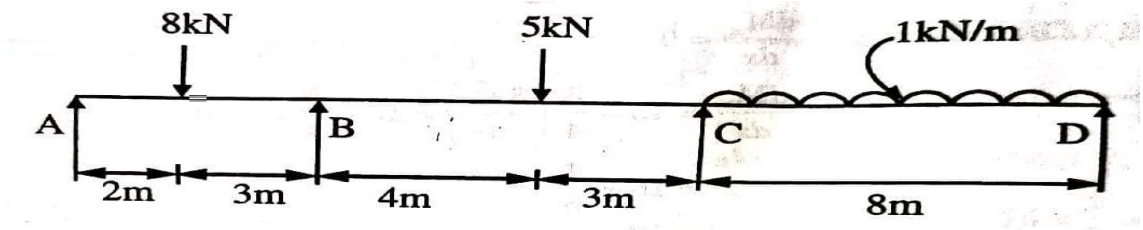

Fig. 4

UNIT-V

9. a. Explain about Castigliano's first theorem. 6M

   b. Calculate the deflection and slope at the free end of a cantilever beam carrying a uniformly distributed load 'w' per unit length over the entire span using Castigliano's first theorem. 8M

(OR)

10. Determine the horizontal and vertical component of the deflection of joint F of the frame shown in Fig. 5. The area of cross-section of all the members is 1500 mm^2 and E is 200 GPa. 14M

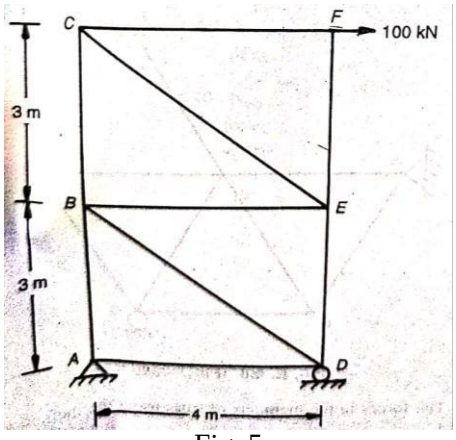

Fig. 5

Q.P. Code: 1801504 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
SUB: Geotechnical 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) Derive the Expression $\gamma_{Sat} = \frac{(G+Se)}{1+e}\gamma_w$. **7M**

   (b) A soil has bulk density of 20.1 kN/m^3 and water content of 15%. Calculate the water content if the soil partially dries to a density of 19.4 kN/m^3 and the void ratio remains unchanged. **7M**

(OR)

2. (a) Explain plasticity chart with neat diagram **7M**

   (b) A fine grained soil is found to have a liquid limit of 80% and plasticity index of 50. The natural water content is 28%. Determine the liquidity index and indicate the probable consistency of the natural soil. **7M**

UNIT – II

3. (a) Describe the factors affecting permeability of soils. **7M**

   (b) In a falling head permeability test on a sample 10.2cm high and 42.41cm² in cross sectional area, the water level is a stand pipe of 6.25mm internal diameter dropped from a height of 75 cm in 15 minutes. Find the coefficient of permeability **7M**

(OR)

4. (a) Explain quick sand condition **7M**

   (b) Explain properties and uses of flow net. Determine the neutral and effective stress at a depth of 16 m below the ground level for the following conditions: Water table is 3 m below ground level ; G = 2.68; e = 0.72;average water content of the soil above water table is 8%. **7M**

UNIT – III

5. (a) Describe the construction procedure of Newmark's influence chart. **7M**

   (b) A concentrated load of 22.5kN acts on the surface of a homogeneous soil mass of large extent. Find the stress intensity at a depth of 15m and (1) directly under the load, and (2) at a horizontal distance of 7.5m. Use Boussinesq's equation. **7M**

(OR)

6. (a) Describe the assumptions and limitations of Boussinesq's equation **7M**

   (b) A load 1000 kN acts as a point load at the surface of a soil mass. Estimate the stress at a point 3 m below and 4 m away from the point of action of the load by Boussinesq's formula. Compare the value with the result from Westergaard's theory. **7M**

UNIT – IV

7. (a) Describe the effects of compaction on soil properties **7M**

   (b) An earth embankment is compacted at a water content of 18% to a bulk density of 19.2 kN/m^3. If the specific gravity of the sand is 2.7, find the void ratio and the degree of saturation of the compacted embankment. **7M**

(OR)

8. (a) Define 'preconsolidation pressure'. In what ways in its determination important in soil engineering practice? Describe a suitable procedure for determining the preconsolidation pressure. **7M**

   (b) A layer of soft clay is 6 m thick and lies under a newly constructed building. The weight of sand overlying the clayey layer produces a pressure of 260 kN/m^2 and the new construction increases the pressure by 100 kN/m^2. If the compression index is 0.5, compute the settlement. Water content is 40% and specific gravity of grains is 2.65. **7M**

UNIT-V

9. (a) Explain the principle of the direct shear test. What are the advantages of this test ? What are its limitations? **7M**

   (b) Differentiate between unconsolidated undrained test and a drained test. Under what conditions are these test results used for design purposes? **7M**

(OR)

10. (a) Explain the Mohr-Coulomb strength envelope. **7M**

    (b) Calculate the potential shear strength on a horizontal plane at a depth of 3 m below the surface in a formation of cohesionless soil when the water table is at a depth of 3.5 m. The degree of saturation may be taken as 0.5 on the average. Void ratio = 0.50; grain specific gravity = 2.70; angle of internal friction = 30°. What will be the modified value of shear strength if the water table reaches the ground surface ? **7M**

Q.P. Code: 1801505 | **SET - 1**

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

B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021

SUB: Environmental 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 the role of environmental engineer in society	7M
	(b)	Explain the objectives of water supply system	7M
		(OR)	
2.	(a)	What is per capita demand of water? Explain fluctuations in water demand	5M
	(b)	Forecast the future population of kadapa city for the year 2031, based on the given past census record. Use Arithmetic and incremental increase method	9M

Year	:	1961	1971	1981	1991	2001	2011
Population(in lakhs):		0.65	1.20	1.80	2.60	3.20	3.50

UNIT – II

3.	(a)	Explain the suitability of various sources water for water supply scheme.	7M
	(b)	Write about impurities in water	7M
		(OR)	
4.	(a)	Explain the following water quality parameters i) Turbidity ii)TDS iii) Hardness and iv) E-coli	8M
	(b)	Explain the standards of water as per BIS	6M

UNIT – III

5.	(a)	With neat sketch, explain the flow chart of water treatment units.	7M
	(b)	Design a sedimentation tank to treat 10 MLD of water. Assume suitable data if required.	7M
		(OR)	
6.	(a)	Design set of rapid sand filters for treating 2 MLD of water. Assume suitable data if required.	7M
	(b)	Explain the various minor disinfection methods.	7M

UNIT – IV

7.	(a)	Explain the working principles and functions of aeration process.	7M
	(b)	Write short notes on de-fluoridation methods.	7M
		(OR)	
8.	(a)	Explain about rain water harvesting methods.	7M
	(b)	Describe the causes and effects of water pollution.	7M

UNIT-V

9.	(a)	Discuss with merits and demerits of various layout of water distribution systems	7M
	(b)	Derive the Hardy-Cross equation for pipe network analysis	7M
		(OR)	
10.	(a)	Explain the laying and testing of pipe lines	7M
	(b)	Explain the importance and uses of valves in water distribution	7M

Q.P. Code: 1801506 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
SUB: Transportation 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)	What are the various types of road patterns in use? Explain with sketches.	7M
	(b)	Explain with sketches the various factors controlling the alignment of road.	7M
		(OR)	
2.	(a)	Compare the Nagpur and Bombay road development plans.	7M
	(b)	Discuss the various engineering surveys required for locating a highway.	7M

UNIT – II

3.	(a)	How the traffic volume studies conducted and data are presented?	7M
	(b)	Derive an expression for finding the overtaking sight distance on highways with neat sketch.	7M
		(OR)	
4.	(a)	Define superelevation? Derive an expression for finding superelevation.	7M
	(b)	Define Gradient? Explain the various types of gradients in highways.	7M

UNIT – III

5.	(a)	Explain the relation between speed, flow and density with neat sketches.	7M
	(b)	The average normal flow of traffic on two cross roads A and B are during design periods are 400 and 250 PCU /hr. The saturation flow values on these roads are estimated as 1250 and 1000 PCU/hr respectively. The all red time for pedestrian carrying is 12 seconds. Design the two phase traffic signal approach by Webster method and draw the phase diagram.	7M
		(OR)	
6.		What are the various types of traffic signs? Describe and explain with sketches.	14M

UNIT – IV

7.	(a)	Draw the cross section of flexible pavement. Discuss the functions of components.	7M
	(b)	Explain briefly, various methods of pavement design.	7M
		(OR)	
8.	(a)	Discuss the factors affecting the design of pavements.	7M
	(b)	Using the data below, calculate the stresses at interior, corner and edge regions of CC pavement by Westergaard's stress equations. Modulus of elasticity of concrete = $3x10^5$ kg/cm^2 Poisson's ratio of concrete = 0.15 Thickness of concrete slab = 22 cm Modulus of subgrade reaction = 8.0 kg/cm^2 Wheel load = 5100 kg Radius of loaded area = 15 cm	7M

UNIT-V

9.	(a)	What are the desirable properties of aggregates? Explain the significance of each.	7M
	(b)	Explain the construction of Water Bound Macadam roads.	7M
		(OR)	
10.	(a)	List out the various tests on bitumen. Explain Viscosity test on bitumen.	7M
	(b)	Discuss the importance of highway drainage.	7M

Q.P. Code: 1801510 | **SET - 1**

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

B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021

SUB: Remote Sensing & GIS (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 physics of remote sensing	6M
	(b)	Define spectral signature. Explain the spectral signatures of vegetation and soil with figures	8M
		(OR)	
2.	(a)	Explain the elements of remote sensing in detail	6M
	(b)	Describe the various bands and uses of Electromagnetic radiation in detail	8M

UNIT – II

3.		Define: (i) Geostationary satellite and Polar satellite (ii) IFOV (iii) Revisit period (iv) Radiometric resolution. (v) Swath width	14M
		(OR)	
4.	(a)	Explain the platforms used in remote sensing.	6M
	(b)	State the characteristics of LANDSAT, SPOT, INSAT	8M

UNIT – III

5.		Write short notes on (i) Radiometric correction (ii) Edge enhancement (iii)Kappa co-efficient.	14M
		(OR)	
6.	(a)	Define digital image processing. Discuss steps involved in image processing briefly.	6M
	(b)	Discuss the elements of visual interpretation techniques	8M

UNIT – IV

7.	(a)	Define GIS. Discuss the components of GIS in detail	6M
	(b)	Write a note on database management systems	8M
		(OR)	
8.	(a)	Write short notes on (i) Data analysis (ii) Data display (iii)Data input	6M
	(b)	Explain raster data structures in detail.	8M

UNIT-V

9.		Explain the applications of remote sensing and GIS in drought monitoring	14M
		(OR)	
10.		How is remote sensing used in water resource applications?	14M

Q.P. Code: 1802510 | **SET - 1**

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

B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021

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 working principle of Silicon Controlled Rectifier (SCR)	5M
	(b)	Analyze the static V-I Characteristics of SCR	9M
		(OR)	
2.	(a)	Explain the need of static and dynamic equalization circuits for SCR	7M
	(b)	Calculate the static equalizing resistance in a series connected SCR	7M

UNIT – II

3.	(a)	Explain the operation of 1-phase full bridge converter by considering R-L Load. Derive the expression for average output voltage. Plot curve between output voltage and firing angle. (Assume continuous load current)	7M
	(b)	A 1-phase full bridge converter is used to regulate dc output voltage. The rms value of ac input is 230V 50Hz and firing angle α is 30˚ so that the load current is continuous and 5A. Calculate (i) DC output voltage (ii) Active and reactive power	7M
		(OR)	
4.	(a)	Explain the operation of 1-phase dual converter for R-L load by considering circulating current mode of operation	7M
	(b)	A single phase dual converter operated from 230V, 50Hz supply and the load resistance is 20W, the circulating inductance is Lc=25mH, delay angles are $\alpha 1=60°$and $\alpha 2=120°$. Calculate peak circulating current and peak current of converter I.	7M

UNIT – III

5.		Explain the working principle of single phase AC voltage controller with R & RL load. Derive the expression for RMS load voltage.	14M
		(OR)	
6.	(a)	Explain the operation of single phase AC triac based circuit when controlling power to RL loads. Draw the output voltage, current waveforms with neat circuit diagram.	10M
	(b)	Compare the mid-point and full bridge configurations of single phase cyclo-converters	4M

UNIT – IV

7.	(a)	Explain the operating principle of Basic Chopper. Derive an expression for output voltage	8M
	(b)	Explain the various control strategies employed for control of output voltage of chopper	6M
		(OR)	
8.	(a)	Explain Two – quadrant operation of chopper	7M
	(b)	A step-up chopper has input voltage of 220V and output voltage of 660V.If the conducting time of thyristor –chopper is 100μsec, compute the pulse width of output voltage. In case output – voltage pulse width is halved for constant frequency operation, find the average value of new output voltage.	7M

UNIT-V

9.	(a)	Draw and explain the operation of single phase full bridge inverter with RL load and derive the expression for RMS output voltage.	7M
	(b)	Briefly discuss about harmonic reduction techniques in single phase inverters	7M
		(OR)	
10.	(a)	Draw and explain the operation of basic parallel capacitor inverter	7M
	(b)	Discuss about the space vector modulation technique in inverters.	7M

Q.P. Code: 1802504 | **SET - 1**

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

B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021

SUB: Power System Operation and Control (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) Derive an expression for the maximum power transfer between two nodes. Show that this power is maximum when $X = \sqrt{3R}$, where *X* is the reactance and *R* is the resistance of the system. 7M

   (b) A 50Hz, four pole turbo generator rated 100 MVA, 11 kV has an inertia constant of 8.0 MJ/MVA. 7M
   (i) Find the stored energy in the rotor at synchronous speed.
   (ii) If the mechanical input is suddenly raised to 80 MW for an electrical load of 50 MW, find rotor acceleration, neglecting mechanical and electrical losses.
   (iii) If the acceleration calculated in part (ii) is maintained for 10 cycles, find the change in torque angle and rotor speed in revolutions per minute at the end of this period.

(OR)

2. (a) Derive swing equation and discuss its application in the study of power system stability. 7M

   (b) A 50 Hz synchronous generator is connected to an infinite bus through a line. The p.u. reactances of generator and the line are j0.3 p.u. and j0.2 p.u. respectively. The generator no-load voltages is 1.1 p.u. and that of infinite bus is 1.0 p.u. The inertia constant of the generator is 3 MW-sec/MVA. Determine the frequency of natural oscillations if the generator is loaded to (i) 60% and (ii) 75% of its maximum power transfer capacity and small perturbation in power system. 7M

UNIT – II

3. (a) Explain the following terms with reference to power plants 7M
   (i) Input –output curve (ii) heat rate curve (iii) incremental fuel cost and production cost.

   (b) The fuel cost of two generators is given by. 7M
   $C_1=0.1P_{G1}^2+20P_{G1}+1.5$ Rs./hr
   $C_2=0.1P_{G2}^2+30P_{G2}+1.9$ Rs./hr
   The real power generation of units P_{G1} and P_{G2} are in MW.
   Determine the most economical load sharing between the generators, when the total demand on the system is 200MW.

(OR)

4. Consider the following three IC curves: 14M
   $PG1= -100+50(IC_1) +2(IC_1)^2$
   $PG2= -150+60(IC_2) - 2.5(IC_2)^2$
   $PG3= -80+40(IC_3) - 1.8(IC_3)^2$
   Where IC's are in Rs. / MWh and PG's are in MW.
   The total load at a certain hour of the day is 400 MW. Neglect transmission losses, find
   a) Total cost of generation per day of 400 MW with economical load sharing.
   b) Total cost of generation per day of 400 MW with equal load sharing.

UNIT – III

5. (a) What is the function of the hydraulic amplifier? 4M

(b) A two plant system having a steam plant near the load center and a hydro plant at a remote location. The load is 500MW for 16hr a day and 350 MW for 8hr a day. 10M

The characteristics of the units are

$C_1 = 120+45P_{GT} + 0.075 P_{GT}^2$

$w_2 = 0.6P_{GH}+0.00283P_{GH}^2$ m^3/s

Loss coefficient, $B_{22}=0.001MW^{-1}$

Find the generation schedule, daily water used by the hydro plant, and daily operating cost of the thermal plant for γ_j=85.5 Rs./m^3-hr.

(OR)

6. (a) Derive the mathematical model of speed governor system. 7M

(b) A 125 MVA turbo-alternator operator on full load operates at 50Hz. A load of 50 MW is suddenly reduced on the machine. The steam valves to the turbine commence to close after 0.5s due to the time lag in the governor system. Assuming the inertia to be constant, H= 6 kW-s per kVA of generator capacity, calculate the change in frequency that occurs in this time. 7M

UNIT – IV

7. (a) What is the necessity of keeping frequency constant? 4M

(b) Find the static frequency drop if the load is suddenly increased by 25 MW on a system having the following data: 10M

Rated capacity P_r = 500 MW

Operating Load P_D= 250 MW

Inertia constant H= 5 s

Governor regulation R= 2 Hz p.u. MW

Frequency f= 50 Hz.

Also find the additional generation.

(OR)

8. (a) Discuss block diagram representation of load frequency control of an isolated power system. 7M

(b) Two generators of rating 100 and 200 MW are operated with a droop characteristic of 6% from no load to full load. Determine the load shared by each generator, if a load of 270 MW is connected across the parallel combination of those generators. 7M

UNIT-V

9. (a) Draw and explain the economic dispatch control. 7M

(b) Determine the frequency of oscillations of the tie-line power deviation for a two-identical-area system given the following data: 7M

R = 3.0 Hz / p.u.; H = 5s ; f_0= 60 Hz

The tie-line has a capacity of 0.1p.u and is operating at a power angle of 45°.

(OR)

10. (a) Write the expressions for area control error in two-area system. 4M

(b) Two interconnected Area-1 and Area-2 have the capacity of 2,000 and 500 MW, respectively. The incremental regulation and damping torque coefficient for each area on its own base are 0.2p.u. and 0.8 p.u., respectively. Find the steady-state change in system frequency from a nominal frequency of 50 Hz and the change in steady-state tie-line power following a 750 MW change in the load of Area-1. 10M

Q.P. Code: 1802507 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
SUB: Advanced 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. Consider a unity feedback system with open loop transfer function, $G(s) = \frac{K}{s(1+2s)}$. Design a suitable lag Compensator to meet the following specifications. (i) phase margin is 40 degrees (ii) Steady state error of ramp input is less than or equal to 0.2. **14M**

(OR)

2. Consider a unity feedback system with open loop transfer function, $G(s) = \frac{5}{s(s+0.5)(s+1)}$ design a PD controller so that the phase margin of the system is 30degrees at a frequency of 1.2 rad/sec. **14M**

UNIT – II

3. (a) Sketch and explain the basic elements used to construct the block diagram of state model **6M**
   (b) Obtain the expression for transfer function of linear time invariant systems state model is **8M**

$$\dot{X}(t) = AX(t) + BU(t); Y(t) = CX(t) + DU(t)$$

(OR)

4. $A=\begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$ compute state transition matrix using matrix exponential. **14M**

UNIT – III

5. (a) State and explain the principle of duality between controllability and observability **7M**
   (b) Consider a linear system described by the differential equation $\ddot{y} + 2\dot{y} + y = \dot{u} + u$ with x1 = y and x2 = $\dot{y} - u$. Determine the controllability and observability of the system. **7M**

(OR)

6. Check the observability of the following system. **14M**

$$\dot{X} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & -2 & -3 \end{bmatrix} X + \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} U \quad \text{and} \quad Y = \begin{bmatrix} 3 & 4 & 1 \end{bmatrix} X$$

UNIT – IV

7. Given the transfer function $\frac{10}{s(s+1)(s+2)}$ Design a feedback controller so that the closed loop system poles are placed at -2, -1±j1 **14M**

(OR)

8. (a) What is full order and reduced order state observers **6M**
   (b) Determine state observer gain matrix. **8M**

$$\dot{X} = AX \quad A = \begin{bmatrix} -1 & 1 \\ 2 & -2 \end{bmatrix} \quad C = \begin{bmatrix} 1 & 0 \end{bmatrix}$$
$$Y = CX$$

UNIT-V

9. (a) Write down the Liapunov Stability and instability Theorems. **8M**
   (b) Determine the stability of the following system $\dot{X} = AX$. where $A=\begin{bmatrix} -1 & -2 \\ 1 & 4 \end{bmatrix}$ **6M**

(OR)

10. Explain the methods to construct liapunov function for non linear systems **14M**

Q.P. Code: 1803501 | **SET - 1**

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

B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021

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) Explain various modes of heat transfers with governing laws. 6M
   (b) A steel pipe line (k=50 W/mK) of I.D. 100 mm and O.D. 110 mm is to be covered with two layers of insulation each having a thickness of 50 mm. The thermal conductivity of the first insulation material is 0.06 W/mK and that of the second is 0.12 W/mK. Calculate the loss of heat per meter length of the pipe and the interface temperature between the two layers of insulation when the temperature of the inside tube surface is 250^0C and that of the outside surface of the insulation is 50^0C. 8M

(OR)

2. (a) For the case of a cylinder, derive heat flow rate for one-dimensional heat conduction in a radial direction. 6M
   (b) An electrical transmission line made of a 25 mm annealed copper wire carries 200 A and has a resistance of $0.4x10^{-4}$ Ω/m length. If the surface temperature is 200^0C and the ambient temperature is 10^0C, determine the heat transfer coefficient between the wire surface and the ambient air and the maximum temperature of the wire. Assume k=160 W/mK. 8M

UNIT – II

3. (a) What are Heisler charts? Explain their significance in solving transient heat conduction problems. 6M
   (b) On a hot summer's day a concrete highway may reach a temperature of 55^0C. Suppose that a stream of water is directed on the highway so that the surface temperature is suddenly lowered at 35^0c. How long will it take to cool the concrete to 45^0C at a depth of 5 cm from the surface? 8M

(OR)

4. (a) A thin fin of length L has its two ends fixed to two parallel walls at temperature T_1 and T_2. The temperature of the environment being T_∞. Derive an expression for one dimensional temperature distribution along the length of the fin. 10M
   (b) Define fin efficiency and effectiveness. 4M

UNIT – III

5. (a) Distinguish between (i) A black body and gray body 6M
   (ii) Specular and diffuse surface
   (iii)Absorptivity and emissivity of a surface
   (b) A gray surface is maintained at a temperature of 827^0C. If the maximum spectral emissive power at that temperature is $1.37x10^{10}$ W/m^3 determine the emissivity of the body and the wavelength corresponding to the maximum spectral intensity of radiation 8M

(OR)

6. (a) What is radiation shape factor? Explain its significance 4M
   (b) A pipe carrying steam having an outside diameter of 20 cm runs in a large room and is exposed to air at a temperature of 30^0C. The pipe surface temperature is 400^0C. Calculate the loss of heat to surroundings per meter length of the pipe due to thermal radiation. The emissivity of the pipe surface is 0.8. What would be the loss of heat due to radiation if the pipe is enclosed in a 40 cm diameter brick conduit of emissivity 0.91? 10M

UNIT – IV

7. (a) What is Reynolds analogy? Describe the relation between fluid friction and heat transfer 6M

   (b) Engine oil flows through a 50 mm diameter tube at an average temperature of 147^0C. The flow velocity is 80 cm/s. calculate the average heat transfer coefficient if the tube wall is maintained at a temperature of 200^0C and it is 2 m long. 8M

(OR)

8. (a) Explain for the fluid flow along a flat plate , 6M
   (i) hydrodynamic boundary layer development
   (ii) thermal boundary layer development

   (b) Air at 20^0C is flowing along a heated plate at 134^0C at a velocity of 3 m/s. The plate is 2 m long and 1.5 m wide. Calculate the thickness of the hydrodynamic boundary layer and the skin friction coefficient at 40 cm from the leading edge of the plate. The kinematic viscosity of air at 20^0C may be taken as 15.06×10^{-6} m^2/s. Also calculate the local heat transfer coefficient at x= 0.4 m and the heat transfer from the first 40 cm of the plate. 8M

UNIT-V

9. (a) What is fouling? What is its effect on heat transfer rate in a heat exchanger? 4M

   (b) A counter flow concentric tube heat exchanger is used to cool engine oil (c=2130 J/kgK) from 160^0C to 60^0C with water, available at 25^0C as the cooling medium. The flow rate of cooling water through the inner tube of 0.5 m diameter is 2 kg/s while the flow rate of oil through the outer annulus O.D. =0.7 m is also 2 kg/s. If the value of the overall heat transfer coefficient is 250 W/m^2K, how long must the heat exchanger be to meet its cooling requirement? 10 M

(OR)

10. (a) Discuss briefly the various regimes in pool boiling of water. 6M

    (b) Water is boiled at a rate of 30 kg/h in a copper pan, 30 cm in diameter, at atmospheric pressure. Estimate the temperature of the bottom surface of the pan assuming nucleate boiling conditions. 8M

Q.P. Code: 1803502 | **SET - 1**

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

B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021

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)	What are the theories of failure under static load? Explain.	7M
	(b)	Define the following properties of a material : (i) Ductility, (ii) Toughness, (iii) Hardness and (iv) Creep	7M
		(OR)	
2.	(a)	Draw the stress-strain diagram for mild steel. Explain.	7M
	(b)	A mild steel rod of 12 mm diameter was tested for tensile strength with the gauge length of 60 mm. Following observations were recorded: Final length = 80 mm; Final diameter = 7 mm; Yield load = 3.4 kN and Ultimate load = 6.1 kN. Calculate: 1. yield stress, 2. ultimate tensile stress, 3. percentage reduction in area, and 4. percentage elongation.	7M

UNIT – II

3.	(a)	Write down Goodman's equation for combination stresses.	7M
	(b)	Mention the methods of reducing stress concentration.	7M
		(OR)	
4.	(a)	A 20 KN tensile load acts on the following members. Considering stress concentration. Calculate the maximum stress induced in each member. i) A stepped shaft of diameter 50 mm & 25 mm with fillet radius 5mm ii) A rectangular plate 60 mm wide and 10 mm thick with a transverse hole of 12 mm diameter.	7M
	(b)	Explain Soderberg Method	7M

UNIT – III

5.	(a)	A double riveted lap joint with zig-zag riveting is to be designed for 13 mm thick plates. Assume σt = 80 MPa ; τ = 60 MPa ; and σc = 120 MPa State how the joint will fail and find the efficiency of the joint.	10M
	(b)	What do you understand by the term riveted joint? Explain the necessity of such a joint.	4M
		(OR)	
6.		Design a double riveted butt joint with two cover plates for the longitudinal seam of a boiler shell 1.5 m in diameter subjected to a steam pressure of 0.95 N/mm2. Assume joint efficiency as 75%, allowable tensile stress in the plate 90 MPa; compressive stress 140 MPa ; and shear stress in the rivet 56 MPa.	14M

UNIT – IV

7.		A shaft is supported on bearings A and B, 800 mm between centres. A 20° straight tooth spur gear having 600 mm pitch diameter, is located 200 mm to the right of the left hand bearing A, and a 700 mm diameter pulley is mounted 250 mm towards the left of bearing B. The gear is driven by a pinion with a downward tangential force while the pulley drives a horizontal belt having 180° angle of wrap. The pulley also serves as a flywheel and weighs 2000 N. The maximum belt tension is 3000 N and the tension ratio is 3 : 1. Determine the maximum bending moment and the necessary shaft diameter if the allowable shear stress of the material is 40 MPa.	14M
		(OR)	
8.	(a)	Two 400 mm diameter pulleys are keyed to a simply supported shaft 500 mm apart. Each pulley is 100 mm from its support and has horizontal belts, tension ratio being 2.5. If the shear stress is to be limited to 80 MPa while transmitting 45 kW at 900 r.p.m., find the shaft diameter if it is to be used for the input-output belts being on the same or opposite sides.	10M
	(b)	Define shaft and which materials used.	4M

UNIT-V

9.	(a)	What is a cotter and when a cotter joint is used?	7M
	(b)	Mention the possible modes of failure of cotter in a cotter joint.	7M
		(OR)	
10.	(a)	What is a key? Classify the keys	4M
	(b)	A shaft and key are made of the same material and the key width is 1/3rd of the shaft diameter. (i) Considering shear only, determine the minimum length of the key in terms of the shaft diameter. (ii) Determine thickness of the key, to make the key equally strong in shear and crushing; taking the shear strength of the key material as 40% of its crushing strength.	10M

Q.P. Code: 1803503 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
SUB: Metrology (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)	Based on the relation between the shaft and the hole classify types of fits. Explain in detail	8M
	(b)	Explain the unilateral and Bilateral systems with suitable example	6M
		(OR)	
2.	(a)	Find the values of allowance and tolerance for the hole and shaft assembly for the following dimensions of mating parts: Hole: $30^{+0.05}_{+0.00}$ Shaft: $30^{-0.02}_{-0.05}$	6M
	(b)	Describe interchangeable assembly with suitable example and write its advantages	8M

UNIT – II

3.	(a)	Explain about slip gauges and the procedure for wringing the slip gauges	7M
	(b)	Explain the working principle of any one Dial Indicator with a neat sketch	7M
		(OR)	
4.	(a)	Explain the construction of sine bar and derive the expression to find the taper angle	7M
	(b)	State and explain the Taylor's principle of gauge design with neat sketch	7M

UNIT – III

5.	(a)	Briefly explain about optical flat its uses and limitations	7M
	(b)	Describe the construction of an optical projector with neat sketch	7M
		(OR)	
6.	(a)	Explain the average surface roughness methods of CLA and RMS	7M
	(b)	Describe the straight edge method for measuring the straightness of a surface.	7M

UNIT – IV

7.	(a)	Name the important elements of thread which are required to be measured in order to determine the accuracy of screw threads. Explain briefly	7M
	(b)	Describe the pitch measurement of internal screw threads by various methods	7M
		(OR)	
8.		Explain how can you measure the effective diameter of the screw thread by two wire method	14M

UNIT-V

9.	(a)	Explain the working principle of Parkinson gear tester.	7M
	(b)	Write essential characteristics of good comparator.	7M
		(OR)	
10.	(a)	List out various mechanical comparators and explain reed type comparator in detail.	7M
	(b)	Explain pneumatic comparator in detail	7M

Q.P. Code: 1803504 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
SUB: Dynamics of Machinery (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 radial engine has three cylinders whose axes are spaced at an angular interval of 120^0. The three connecting rods of the cylinders are coupled directly to a single crank. The stroke is 120 mm, and the length of each connecting rod is 180 mm. The mass of the reciprocating parts per cylinder is 1 Kg. Find the resultant primary and secondary forces acting on the frame of the engine when the engine is running at 3150 r.p.m. **14M**

(OR)

2. A single cylinder horizontal engine runs at 150 rpm. The length of the stroke is 600 mm. The mass of the revolving parts assumed concentrated at the crank pin is 200 kg and mass of reciprocating parts is 160 kg. Determine the magnitude of the balancing mass required to be placed opposite to the crank at a radius of 170mm which is equivalent to all the revolving and 2/3rd of the reciprocating masses. If the crank turns 30^0 from the inner dead centre, find the magnitude of the unbalanced force due to the balancing mass? **14M**

UNIT – II

3. (a) Draw the tuning moment diagrams for the following different types of engines, neglecting the effect of inertia of the connecting rod: **7M**
   i. Single cylinder double acting steam engine
   ii. Four stroke cycle. I.C. engine
   (b) A Punching press is driven by a constant torque electric motor. The press is provided with a flywheel that rotates at maximum speed of 225 rpm. The radius of gyration of the flywheel is 0.5m.The press punches 720 holes per hour, each punching operation takes 2 seconds and requires 15 kN-m of energy. Find the power of the motor and minimum mass of the flywheel if speed of the same is not to fall below 200 rpm? **7M**

(OR)

4. (a) Differentiate between terms crank pin effort and crank effort. Derive an expression for crank pin effort in terms of piston effort? **5M**

   (b) A cast iron flywheel is fitted to a punch press to run at 90 rpm and must supply 12 kN-m of energy during $1/5^{th}$ revolution and allow 15% change of speed. The rim speed is limited to 350m/min. Find the mean diameter and weight of the fly wheel and the motor power. Assume overall efficiency as 80%. **9M**

UNIT – III

5. (a) Write about isochronism and hunting? **5M**
   (b) In a spring controlled governor, the radial force acting on the balls was 4500 N when the center of the balls were 200mm from axis and 7500 N when at 300mm. Assuming that the force varies directly as the radius, find the radius of the ball path when the governor runs at 270 rpm. Also find what alteration in spring load is required in order to make the governor isochronous and the speed at which it would then run. The mass of each ball is 30 kg. **9M**

(OR)

6. A governor of the Proell type has each arm is 250mm long. The Pivots of the upper and lower arms are 25mm form the axis. The central load acting on the sleeve has a mass 25Kg and each rotating ball has a mass of 3.2Kg when the governor sleeve is in mid position, the extension link of the lower arm is vertical and the radius of path of the rotation of the masses is 175mm, the vertical height of the governor is 200mm, if the speed of the governor is 160rpm, when in the mid position, find: i) Length of the extension link. ii) Tension in upper arm **14M**

UNIT – IV

7. (a) Discuss the working of absorption type dynamometers? 6M

(b) The rotor of a marine turbine has a moment of inertia of 750 kg.m^2 and rotates at 3000 rpm clockwise when viewed from the front. If the ship pitches with angular simple harmonic motion having a periodic time of 16 sec and amplitude of 0.1 radian find 8M

i) The maximum angular velocity of the rotor axis
ii) The maximum value of the gyroscopic couple
iii) The gyroscopic effect as the bow dips.

(OR)

8. (a) A simple band brake is operated by a lever of length 450 mm. The brake drum has a diameter of 600 mm, and the brake band embraces 5/8th of the circumference. One end of the band is attached to the fulcrum of the lever while the other end is attached to a pin on the lever 120 mm from the fulcrum. The effort applied to the end of the lever is 2 kN, and the coefficient of friction is 0.30. Find the maximum braking torque on the drum. 9M

(b) Explain in what way the gyroscopic couple effects the motion of an aircraft while taking a turn. 5M

UNIT-V

9. (a) Discuss whirling of shafts and critical speeds in detail? 7M

(b) A shaft of 100 mm diameter and 1 m long is fixed at one end, and the other end carries a flywheel of mass 1 tonne. The radius of gyration of the flywheel is 0.5 m. Find the frequency of torsional vibrations, if the modulus of rigidity of the shaft material is 80 GN/m^2. 7M

(OR)

10. Two rotors A and B are attached to the ends of a shaft 600mm long. The mass of the rotor A is 400Kg and its radius of gyration is 400mm. The corresponding values of rotor B are 500Kg and 500mm respectively. The shaft is 80mm diameter for the first 250mm, 120mm diameter for next 150mm and 100mm diameter for the remaining length. Modulus of rigidity of the shaft material is 0.8 x 10^5 MN/m^2. Find the position of the node, the frequency of torsional vibrations? 14M

Q.P. Code: 1803506 **SET - 1**

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

B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021

SUB: Automobile Engineering (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)	List atleast six IC engine components and mention their functioning, material they are made up of and a schematic of the same.	7M
	(b)	Explain with suitable sketches and valve time diagram, the working of a Variable Valve Timing (VVT) system used in automobiles.	7M
		(OR)	
2.	(a)	What are the modern classifications of automobiles depends on power generation. How hybridization factor helps to identify this classification with suitable diagrams.	7M
	(b)	Justify the necessity of each component of an engine in an automobile with neat diagrams.	7M
		UNIT – II	
3.	(a)	What are the factors that make the clutch necessary? Briefly explain the working of a single plate clutch.	7M
	(b)	With a neat sketch explain sliding mesh gear box.	7M
		(OR)	
4.	(a)	Discuss the working and salient features of the following with a neat sketches 1. Transfer box mechanism 2. Hotch –Kiss drive	7M
	(b)	Explain the construction of fluid Flywheel and write the advantages and disadvantages	7M
		UNIT – III	
5.	(a)	Describe the working of Davis steering gear mechanism with a neat sketch	7M
	(b)	Explain Pneumatic brakes with neat sketch.	7M
		(OR)	
6.	(a)	Describe with an illustration the steering geometry and how it affects motion of an automobile. Mention the difference between manual and power assisted steering.	7M
	(b)	Explain the purpose of master cylinder with a neat sketch in hydraulic brakes	7M
		UNIT – IV	
7.	(a)	Explain LPG is an alternative fuel for petrol engine with diagram. Also explain its performance and emission characteristics.	7M
	(b)	Explain the effect of the factors on the formation of NO_x in air pollution.	7M
		(OR)	
8.	(a)	What are the engine modifications to be undertaken in the SI engine for Alcohols or Ethanol as alternative fuels?	7M
	(b)	Explain the merits of Ethanol Fuel and explain the merits and demerits of Hydrogen fuel.	7M
		UNIT-V	
9.	(a)	Explain vacuum advance method in automatic ignition advance method	7M
	(b)	What are the main pollutants from the engine exhaust and mention its effect on the living organisms.	7M
		(OR)	
10.	(a)	Explain the operation of exhaust gas analyzer	7M
	(b)	Describe magneto ignition system with neat sketch	7M

Q.P. Code: 1804506 **SET - 1**

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

B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021

SUB: Microprocessors & Microcontrollers (EEE & 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.		Explain in detail about the internal architecture of an 8086 microprocessor with a block diagram	14M
		(OR)	
2.	(a)	Explain in detail about various registers in 8086 Microprocessor	8M
	(b)	Explain different addressing modes supported by 8085 microprocessor	6M

UNIT – II

3.	(a)	Write an ALP to sort the given numbers in descending order	8M
	(b)	Write an ALP to add, subtract of any two given numbers	6M
		(OR)	
4.	(a)	Write short notes on Address decoding Techniques	6M
	(b)	Explain various Data transfer schemes	8M

UNIT – III

5.	(a)	Explain in detail about 8251 USART with neat block diagram	8M
	(b)	Write an ALP to generate square waveform using DAC	6M
		(OR)	
6.	(a)	Write an ALP to generate Ramp waveform using DAC	8M
	(b)	Write an ALP to generate Step waveform using DAC	6M

UNIT – IV

7.		Describe in detail about the internal architecture of the 8051 microcontroller with a neat block diagram	14M
		(OR)	
8.	(a)	Explain the addressing modes of 8051 Microcontroller	8M
	(b)	Write Short notes on Assembler Directives	6M

UNIT-V

9.	(a)	Explain in detail about various registers in ARM	8M
	(b)	Write Short notes on Data Processing Instructions	6M
		(OR)	
10.	(a)	Explain Multiple register load-store instructions of ARM	6M
	(b)	Explain in detail about Interrupt and vector table	8M

Q.P. Code: 1804502 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
SUB: Digital Signal Processing (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) Find the N-point DFT of the sequence $x(n) = (-1)^n; 0 \le n \le N-1$, where N is an even number. 6M

   (b) Find the linear convolution of the following sequences using DFT: 8M

   (i) $x(n) = \{2, 3, 4\}$, $h(n) = \{3, 7, 0, 5\}$ (ii) $x(n) = \{2, -3, 1, -4, 3, -2, 4, -1\}$, $h(n) = \{2, -1\}$

(OR)

2. (a) How many DFTs and inverse DFTs of length N = 128 are necessary to linearly convolve a sequence x(n) of length 1000 with a sequence h(n) of length 64 using the overlap-add method? Repeat for the overlap-save method. 6M

   (b) Develop a radix-3 decimation-in-time FFT algorithm, and draw the corresponding flow graph for N =9. 8M

UNIT – II

3. (a) With an example explain procedure to realize the lattice structure of FIR system. 7M

   (b) Determine the cascade and parallel structures for the transfer function 7M

$$H(z) = \frac{(1 + 0.3z^{-1})}{(1 - 0.3z^{-1})(1 - 0.5e^{j\frac{\pi}{3}}z^{-1})(1 - 0.5e^{-j\frac{\pi}{3}}z^{-1})}$$

(OR)

4. (a) Draw the direct form and the cascade form of the FIR filter with the following transfer function: 7M

$$H(z^{-1}) = 4(1 + 0.6z^{-1} - 0.5z^{-2})(1 - 0.25z^{-1} + 0.9z^{-2})$$

   (b) Obtain as many structures as you can to realize the following transfer function: 7M

$$H(z) = \frac{(z + 0.2)}{(z + 0.1)(z + 0.4)(z^2 + 0.5z + 0.06)}$$

UNIT – III

5. (a) Design the lowpass inverse Chebyshev filter with a maximum gain of 0 dB in the pass band, ω_p = 1000, Ap = 0.5 dB, ω_s = 2000, and A_s = 40 dB. 7M

   (b) Design a lowpass Butterworth filter with a maximum gain of 5 dB and a cutoff frequency of 1000 rad/s at which the gain is at least 2 dB and a stop band frequency of 5000 rad/s at which the magnitude is required to be less than −25 dB. 7M

(OR)

6. (a) The specifications of a Chebyshev I bandpass filter are $\omega_1 = 10^4$, $\omega_2 = 10^5$, $\omega_s = 2 \times 10^5$, A_p = 0.8 dB, and A_s = 30 dB, and the maximum magnitude in the passband = 10 dB. Design the bandpass filter. 10M

   (b) Compare the impulse invariant and bilinear transformation. 4M

UNIT – IV

7.	(a)	Discuss the design procedure for linear phase FIR filters.	7M
	(b)	Discuss dual tone multi-frequency signal detection and spectral analysis of sinusoidal and non-stationary signals applications of DSP.	7M

(OR)

8.	(a)	Compare and contrast FIR filters with IIR filters.	6M
	(b)	Design an FIR filter of length 9, to get a highpass response, with $\omega_c = 0.4\pi$, using a Hamming window.	8M

UNIT-V

9.	(a)	Describe the interpolation process with a factor of I and then derive its expression.	8M
	(b)	Find the decimated and interpolated version of the following signal; $x(n) = \{3, 6, 8, 9, -2, -1\}$ with the factors 2, 3, 4.	6M

(OR)

10.	(a)	Explain any two applications of multi-rate digital signal processing.	8M
	(b)	Consider a ramp sequence and sketch its interpolated and decimated versions with a factor of '4'.	6M

Q.P. Code: 1804503 **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
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)	Draw the basic functional units of computer and explain each unit in detail.	7M
	(b)	Draw and explain the single bus structure.	7M
		(OR)	
2.	(a)	Explain about micro logic operations with examples.	7M
	(b)	With the help of examples explain the micro shift operations.	7M

UNIT – II

3.	(a)	What are Interrupts? How are they handled?	7M
	(b)	Explain about memory reference instructions.	7M
		(OR)	
4.	(a)	Explain about the micro program example.	7M
	(b)	With a neat block diagram, explain about the micro programmed control unit and its operation in detail?	7M

UNIT – III

5.	(a)	Discuss about the various types of addressing modes with examples in detail.	7M
	(b)	What is the purpose of parallel processing? Categorize and discuss the various forms of parallel processing with a neat sketch.	7M
		(OR)	
6.	(a)	Describe about general register organization.	7M
	(b)	What is the use of pipelining? Explain about arithmetic pipelining.	7M

UNIT – IV

7.	(a)	Write short notes on asynchronous data transfer.	7M
	(b)	Explain about priority interrupt.	7M
		(OR)	
8.	(a)	Explain about serial communication.	7M
	(b)	With a neat sketch, discuss various standard I/O interfaces in detail?	7M

UNIT-V

9.	(a)	Discuss memory hierarchy with reference to Speed, Size and Cost.	7M
	(b)	What is virtual memory? Explain in detail.	7M
		(OR)	
10.	(a)	Explain about the different interconnection structures used in multiprocessors.	7M
	(b)	Discuss the mapping functions of cache.	7M

Q.P. Code: 1804504 | **SET - 1**

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

B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021

SUB: Analog 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)	Briefly discuss about the Need of Modulation .	6M
	(b)	Describe in detail about generation and Detection of DSBSC	8M
		(OR)	
2.	(a)	Explain in detail about the Generation of AM signals.	7M
	(b)	A modulating signal $m(t)=10\cos(2\pi\times10\ 3\ t)$ is amplitude modulated with a carrier signal $c(t)=50\cos(2\pi\times10\ 5\ t)$. Find the modulation index, the carrier power, and the power required for transmitting AM wave.	7M

UNIT – II

3.	(a)	Obtain the expression for (i) Frequency modulation (ii) Phase modulation from angle modulation and draw the respective plots	7M
	(b)	Brief Out the following i. Capture effect in FM ii. Transmission Bandwidth of FM	7M
		(OR)	
4.	(a)	Explain in detail about Direct Method of FM generation	8M
	(b)	Discriminate Amplitude Modulation with Frequency Modulation	6M

UNIT – III

5.	(a)	Illustrate in detail about the Super heterodyne FM receiver	7M
	(b)	Explain the Characteristics of Radio Receivers	7M
		(OR)	
6.	(a)	Explain the following i. Measurement of sensitivity, ii. Measurement of Selectivity	7M
	(b)	With neat block diagram explain Radio broadcast AM transmitters.	7M

UNIT – IV

7.	(a)	Four amplifiers A,B,C and D with gains 16dB,20dB,22dB,36dB and corresponding noise figures of 13dB, 25dB, 46dB, 58dB. Then find i. Overall Noise Figure ii. Overall Gain	7M
	(b)	Discriminate Pre-Emphasis with De-Emphasis	7M
		(OR)	
8.	(a)	Explain about the effect of Noise in FM system	7M
	(b)	Discuss about the effect of noise in AM and find the SNR for AM System	7M

UNIT-V

9.	(a)	Explain in detail about Natural Sampling	7M
	(b)	Describe in detail about generation of Pulse Position Modulation	7M
		(OR)	
10.	(a)	Define sampling theorem and Practical aspects of sampling;	6M
	(b)	Explain the detection of PAM and PPM	8M

Q.P. Code: 1804505 | **SET - 1**

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

B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021

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)	Explain the terms i) DC noise margin ii) Fan-out with reference to TTL gate.	7M
	(b)	How that at a given power-supply voltage, an FCT-type ICCD specification can be derived from an HCT/ACT-type CPD specification, and vice versa.	7M
		(OR)	
2.	(a)	Quantitatively explain the power dissipation of CMOS circuit.	7M
	(b)	Design CMOS transistor circuit for 3-input AND gate. With the help of function Tables explain the operation of the circuit diagram.	7M
		UNIT – II	
3.	(a)	Discuss the system tasks and compiler directives in Verilog HDL.	7M
	(b)	What are different data types available in VHDL? Explain.	7M
		(OR)	
4.	(a)	Explain: i. Modelling Styles ii. Ports	7M
	(b)	Explain the structure of various LOOP statements in VHDL with examples.	7M
		UNIT – III	
5.	(a)	Design a 2 to 4 decoder circuit.	7M
	(b)	Give the entity declaration behavioural model of the above decoder. Also draw the waveform giving relation between its inputs and outputs.	7M
		(OR)	
6.	(a)	Design a 10 to 4 encoder with inputs 1-out of 10 and outputs in BCD.	7M
	(b)	Implement VHDL source code in structural style for the implementation of the above design.	7M
		UNIT – IV	
7.	(a)	Design a full adder with logic gates and write VHDL data flow program for the implementation of the above adder.	7M
	(b)	Design binary to gray code converter using gates and write a Verilog code for the implementation of the above design.	7M
		(OR)	
8.	(a)	Design a 24-bit comparator circuit using 74×682 ICs and explain the functionality of the circuit.	7M
	(b)	Implement VHDL source code in behavioural style for the implementation of the above design.	7M
		UNIT-V	
9.	(a)	Design an 8-bit serial-in and parallel-out shift register with flip-flops. Explain the operation with the help of timing waveforms.	7M
	(b)	Write VHDL data-flow program for the above shift-register.	7M
		(OR)	
10.	(a)	Explain the operation of MOD-10 Counter.	7M
	(b)	Write VHDL data-flow program for the above shift-register.	7M

Q.P. Code: 1804501

SET - 1

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

B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021

Q.P. Code: 1805501 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
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)	Discuss in detail about any three web servers	10M
	(b)	List out the HTTP status codes.	4M
		(OR)	
2.	(a)	How to handle HTTP request and response? Explain in detail with suitable example.	12M
	(b)	What is URI & URL?	2M

UNIT – II

3.	(a)	What is CSS? Explain in detail about various types of style sheets.	7M
	(b)	Write a java script that asks the user to enter two numbers and output text that displays the sum, product, difference and quotient of the two numbers.	7M
		(OR)	
4.	(a)	Explain how to create list & tables in HTML with example?	10M
	(b)	Explain dynamic HTML with java script.	4M

UNIT – III

5.	(a)	What is PHP? Explain data types in PHP.	7M
	(b)	Explain the following i) Associative arrays ii) Indexed arrays iii) Type casting	7M
		(OR)	
6.	(a)	Explain OOPs concepts in PHP.	8M
	(b)	Write a PHP program to print reverse of a given number.	6M

UNIT – IV

7.	(a)	Explain sessions in PHP with examples.	7M
	(b)	Explain briefly how to redirect the HTTP headers to different locations.	7M
		(OR)	
8.	(a)	Explain the following (i) Setting cookies (ii) reading cookies (iii) deleting cookies	9M
	(b)	What is cookie? What are the advantages and disadvantages of cookies?	5M

UNIT-V

9.	(a)	Explain POST & GET methods with suitable examples?	10M
	(b)	Differentiate GET & POST methods.	4M
		(OR)	
10.	(a)	Discuss in detail about how to connect to a MYSQL database , how to retrieve and display results in PHP.	10M
	(b)	How to update and delete records in database using MYSQL with PHP.	4M

Q.P. Code: 1805502 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
SUB: Database Management Systems (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 about three levels of data abstraction.	7M
	(b)	With a neat sketch explain about database architecture.	7M
		(OR)	
2.	(a)	Draw the schema diagram for banking enterprise and explain about it.	7M
	(b)	Explain about various mapping cardinalities between entity sets A and B.	7M
		UNIT – II	
3.	(a)	With an example, explain about the basic structure of SQL queries.	7M
	(b)	Explain about nested sub queries in SQL with an example.	7M
		(OR)	
4.	(a)	Define trigger. Create a trigger for reordering of an item.	7M
	(b)	Discuss about Domain relational calculus by writing queries.	7M
		UNIT – III	
5.	(a)	Explain about BCNG and 3NF.	7M
	(b)	Discuss the various problems caused by Redundancy.	7M
		(OR)	
6.	(a)	Write about Lossless-Join Decomposition.	7M
	(b)	Discuss about multi-valued dependencies.	7M
		UNIT – IV	
7.	(a)	With a diagram explain about various steps involved in query processing.	7M
	(b)	Explain about the ACID properties of Transactions.	7M
		(OR)	
8.	(a)	Discuss about Shadow-copy technique for atomicity and durability.	7M
	(b)	Explain about various selection operations for retrieving records in Query processing.	7M
		UNIT-V	
9.	(a)	Explain about Two-phase locking protocol.	7M
	(b)	Explain about Log-based Recovery.	7M
		(OR)	
10.	(a)	Discuss about multi-version concurrency-control schemes.	7M
	(b)	Explain about the issues to be addressed in designing a Remote backup system.	7M

Q.P. Code: 1805503 **SET - 1**

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

B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021

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)	Perform a comparative study between the ISO OSI model and the TCP/IP reference model.	**7M**
	(b)	Discuss in detail about the packet-switched networks.	**7M**
		(OR)	
2.	(a)	Write any four reasons for using layered protocols.	**7M**
	(b)	Describe in brief about Guided Transmission media.	**7M**
		UNIT – II	
3.	(a)	Explain in detail about the Simplex Stop and Wait protocol.	**7M**
	(b)	Explain how slotted ALOHA solves the problem of Channel allocation.	**7M**
		(OR)	
4.	(a)	Explain the following error detection techniques i) LRC ii) CRC	**7M**
	(b)	Explain the working of CSMA Protocol.	**7M**
		UNIT – III	
5.	(a)	Explain distance vector routing algorithm.	**7M**
	(b)	What is the format of IPv4 header? Describe the significance of each field.	**7M**
		(OR)	
6.	(a)	With an example explain the Dynamic routing algorithms used in computer networks.	**7M**
	(b)	Compare IPV4 and IPV6 protocols.	**7M**
		UNIT – IV	
7.	(a)	How does UDP differ from TCP? List the applications of UDP.	**7M**
	(b)	What are the reasons for congestion? Also write and explain the problems with congestion.	**7M**
		(OR)	
8.	(a)	Explain the elements of a Transport protocol?	**7M**
	(b)	Explain in brief about TCP connection establishment and Release.	**7M**
		UNIT-V	
9.	(a)	What is DNS? What resource records are associated with it? Explain.	**7M**
	(b)	What is electronic mail? Desribe in brief about sending and receiving e-mail	**7M**
		(OR)	
10.	(a)	What is DNS? What are the services provided by DNS and explain how it works.	**7M**
	(b)	What are the five basic functions supported in e-mail systems? Explain	**7M**

Q.P. Code: 1805504 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
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)	Explain the nature of software with an example?	7M
	(b)	Discuss about five generic process framework activities.	7M
		(OR)	
2.		Explain in detail about the software myths?	14M
		UNIT – II	
3.		Mention about the distinct steps of Requirements Engineering Process.	14M
		(OR)	
4.	(a)	Explain about Class Based Modeling with an UML diagram?	8M
	(b)	Draw the Use Case Diagram for Home Intruder Detection System?	6M
		UNIT – III	
5.	(a)	Explain how the Requirements model is translated into Design model?	8M
	(b)	How the architecture is differentiated from design?	6M
		(OR)	
6.	(a)	Explain the characteristics of good design?	7M
	(b)	Discuss about the Data-Centered Architecture.	7M
		UNIT – IV	
7.	(a)	List out the various Golden rules for user interface design?	8M
	(b)	Write short notes on White Box testing?	6M
		(OR)	
8.		Write short notes on i) System Testing ii) Unit Testing iii) Integration Testing	14M
		UNIT-V	
9.	(a)	Write a short note on COCOMO Model.	7M
	(b)	Write about Risk Management.	7M
		(OR)	
10.		Explain in detail about various Empirical Estimation Techniques?	14M

Q.P. Code: 1805507 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
SUB: Distributed Systems (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 distributed system and explain any two goals?	7M
	(b)	Explain distributed pervasive systems	7M
		(OR)	
2.	(a)	Differences between structured peer-to-peer and unstructured peer-to-peer architectures	5M
	(b)	Explain the layered and object-based architectures.	9M

UNIT – II

3.	(a)	With neat diagram explain the concept of threads in distributed systems.	7M
	(b)	Write about thread usage and its implementation in non distributed system.	7M
		(OR)	
4.	(a)	What are the issues in socket programming and explain how it is solved by using the Message – Passing Interface (MPI).	9M
	(b)	Define communication and explain types of communication in distributed system.	5M

UNIT – III

5.	(a)	Compare centralized, Decentralized, Distributed and Token ring algorithms	6M
	(b)	What is clock synchronization and explain Berkeley Algorithm.	8M
		(OR)	
6.	(a)	What is Mutual Exclusion and explain the Centralized Algorithms with neat diagram.	7M
	(b)	Explain election algorithm in wireless network.	7M

UNIT – IV

7.	(a)	Discuss about remote-write protocols and local-write protocols	8M
	(b)	Explain Sequential Consistency and Casual Consistency?	6M
		(OR)	
8.	(a)	Comparison between push-based and pull-based protocols.	6M
	(b)	Define replication and explain reasons for replication	8M

UNIT-V

9.	(a)	Explain different types of failures.	7M
	(b)	What are the basic concepts related to processing failures .	7M
		(OR)	
10.	(a)	Write about independent check pointing and coordinated check pointing	8M
	(b)	Explain the basic reliable multicasting schemes in reliable group communication	6M

Q.P. Code: 1805505 **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
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 different phases of compiler with a neat diagram	8M
	(b)	Write a short note on Boot strapping.	6M
		(OR)	
2.	(a)	Write short notes on input buffer and sentinels.	7M
	(b)	Design Lexical Analyzer for relational operator.	7M
		UNIT – II	
3.	(a)	Find the predictive parser for the following grammar and parse the sentence (a+b) *c. E->E+T|T T->T*F|F F-> (E)| id	10M
	(b)	Explain left recursion and left factoring	4M
		(OR)	
4.	(a)	Discuss in detail about recursive descent parsing.	8M
	(b)	Explain about derivation tree with an example.	6M
		UNIT – III	
5.	(a)	Explain about specification of a simple type checker.	7M
	(b)	Describe in detail about abstract syntax tree.	7M
		(OR)	
6.	(a)	Construct a syntax-directed translation scheme that translates inters into Roman numerals	8M
	(b)	What is syntax directed translation? How it is used for translation of expressions?	6M
		UNIT – IV	
7.	(a)	Explain the various data structures used for implementing the symbol table and compare them.	8M
	(b)	Differentiate among source code, intermediate code and target code.	6M
		(OR)	
8.	(a)	What do you understand by code optimization? Write the algorithm to partition the 3 address code into basic blocks	7M
	(b)	What is register-interference graph? Explain its role in code generation.	7M
		UNIT-V	
9.	(a)	What is meant by register descriptor and address descriptor? Explain	8M
	(b)	What is peephole optimization? Discuss	6M
		(OR)	
10.	(a)	Explain in brief about intermediate code optimization algorithms.	8M
	(b)	How flow graph and DAG are related with each other? Explain	6M

Q.P. Code: 1815505 **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
SUB: Linear Digital IC Applications (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)	Derive an expression for output voltage of a closed loop non-inverting op-amp.	7M
	(b)	What are the main features of IC 741 OP-AMP?	7M
		(OR)	
2.	(a)	Discuss about the DC characteristics of operational amplifier.	7M
	(b)	What is a slew rate? Discuss the methods of improving slew rate.	7M

UNIT – II

3.	(a)	Sketch the circuit diagram of instrumentation amplifier and derive the expression for gain.	7M
	(b)	Derive the output expression for log and antilog amplifiers.	7M
		(OR)	
4.	(a)	Explain the operation of triangular wave generator and derive the expression for amplitude and frequency of oscillation?	8M
	(b)	Explain about current to voltage (I to V) converter with grounded load.	6M

UNIT – III

5.	(a)	Draw the internal diagram of VCO and explain its operation.	6M
	(b)	Derive lock-in range and capture range of PLL with its neat block diagram and its explanation.	8M
		(OR)	
6.	(a)	Derive the expression for the gate width of 555 mono-stable multi-vibrator circuit.	8M
	(b)	Calculate the value of RA for a monostable circuit using 555 timer which issued as divide by 2 network with input frequency of trigger signal is 2 kHz and C = 0.01μF.	6M

UNIT – IV

7.	(a)	With the help of circuit diagram, explain the operation of Emitter Couple Logic gate. List out all its logic levels.	6M
	(b)	Compare the performance of various logic families with reference to power dissipation, propagation time delay, Fan in and Fan out.	8M
		(OR)	
8.	(a)	Explain the CMOS steady state electrical behavior?	7M
	(b)	Explain the operation of open collector and tri-state outputs of Standard TTL NAND gate.	7M

UNIT-V

9.	(a)	With a neat block diagram, explain the components of Verilog module.	7M
	(b)	Write a Verilog program for 3 to 8 decoder using case statement.	
		(OR)	
10.	(a)	Explain the following Verilog data types with an example: (i) Nets (ii)Registers (iii) Integers (iv) parameters (v)Arrays	8M
	(b)	Write a Verilog program on full adder?	6M

Q.P. Code: 1825505 **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. V Sem. (R18) Regular Examinations of February/March - 2021
SUB: Managerial Economics (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.	"Economics is concerned with the application of economic concepts and analysis to the problem of formulating rational individual and national decisions." Discuss.	14M
	(OR)	
2.	How does economics play a role in decision-making at firm level?	14M

UNIT – II

3.	Explain the law of demand. Discuss some practical applications of law of demand	14M
	(OR)	
4.	List out the methods of Demand forecasting. Explain any two methods with illustrations.	14M

UNIT – III

5.	Distinguish the differences between internal and external economies of scale.	14M
	(OR)	
6.	'A managerial economist must have a clear understanding of the different cost concepts for clear business thinking and proper application'. Explain	14M

UNIT – IV

7.	Taking a real life example and discuss the features of the perfect competition	14M
	(OR)	
8.	What is pricing? Explain various methods of pricing with examples.	14M

UNIT-V

9.	Discuss the various sources of long term finance to meet the capital structure requirements of a company.	14M
	(OR)	
10.	A company has to select one of the two following projects. The life of the two projects is 4 years. Both the project requires Rs. 1, 50,000 as an investment. The cash inflows of Project –A are Rs 28,000; Rs 37,000; Rs 42,000 and Rs 17,000 respectively Project –B are Rs 42000; Rs 31,000; Rs 24,000; and Rs 19,000 respectively Calculate Payback period and NPV of both the projects and Suggest which project need to select under each method?	14M