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

**B. Tech. V Sem. (R15) Regular & Supple Examinations of October/November, 2019**

*SUB: Operations Research ( CE)*

Time : 3 Hours             Max. Marks: 70

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

## UNIT – I

1. Explain the applications in different sectors of operations Research    14M

(OR)

2. Solve the following Lp problem using graphical method    14M
   Maximize $Z = 6X_1 + 8X_2$ subject to
   $5X_1 + 10X_2 \leq 60$
   $4X_1 + 4X_2 \leq 40$
   $X_1$ and $X_2 \geq 0$

## UNIT – II

3. Consider the following linear programming problem and solve it using its dual solution    14M
   Minimize $Z = 40X_1 + 30X_2 + 25X_3$ subject to
   $4X_1 + 2X_2 + 5X_3 \geq 30$
   $3X_1 + 6X_2 + X_3 \geq 20$
   $X_1 + 3X_2 + 6X_3 \geq 36$
   $X_1,\ X_2$ and $X_3 \geq 0$

(OR)

4. Solve the following linear programming problem using the result of its dual problem    14M
   Minimize $Z_1 = 24X_1 + 30X_2$ subject to
   $2X_1 + 3X_2 \geq 10$
   $4X_1 + 9X_2 \geq 15$
   $6X_1 + 6X_2 \geq 20$
   $X_1$ and $X_2 \geq 0$

## UNIT – III

5. Obtain the initial basic feasible solution by using Northwest corner cell method for the following data    14M

|        |   | Destination | | | | |
|--------|---|-----|-----|-----|-----|--------|
|        |   | 1 | 2 | 3 | 4 | Supply |
|        | 1 | 3 | 1 | 7 | 4 | 300 |
| Source | 2 | 2 | 6 | 5 | 9 | 400 |
|        | 3 | 8 | 3 | 3 | 2 | 500 |
| Demand |   | 250 | 350 | 400 | 200 | 1200 |

(OR)

6. Obtain the initial basic feasible solution by using least cost cell method for the following data    14M

Destination

|  |  | 1 | 2 | 3 | 4 | Supply |
|---|---|---|---|---|---|---|
|  | 1 | 3 | 1 | 7 | 4 | 300 |
| Source | 2 | 2 | 6 | 5 | 9 | 400 |
|  | 3 | 8 | 3 | 3 | 2 | 500 |
| Demand |  | 250 | 350 | 400 | 200 | 1200 |

**UNIT – IV**

7. There are seven jobs, each of which has to go through the machines A and B in the order AB, processing times in hours are given as    14M

| Job: | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Machine A: | 3 | 12 | 15 | 6 | 10 | 11 | 9 |
| Machine B: | 8 | 10 | 10 | 6 | 12 | 1 | 3 |

Determine a sequence of these jobs that will minimize the total elapsed time T.

(OR)

8. Explain about the travelling sales man problem    14M

**UNIT-V**

9. An organization is planning to diversity its business with a maximum outlay of Rs.5 crores. It has identified three different locations to install plants. The organization can invest in one or more of these plants subject to the availability of the fund. The different possible alternatives and their investment and present worth of returns during the useful life of each of these plants are summarized in table. The first row of table has zero cost and zero return for all the plants. Hence, it is known as do-nothing alternative. Find the optimal allocation of the capital to different plants which maximize the corresponding sum of the present worth of returns.    14M

Table

| Alternative | Plant 1 | | Plant 2 | | Plant 3 | |
|---|---|---|---|---|---|---|
|  | Cost | Return | Cost | Return | Cost | Return |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 1 | 15 | 2 | 14 | 1 | 0 |
| 3 | 2 | 18 | 3 | 18 | 2 | 7 |
| 4 | 4 | 28 | 4 | 21 | -- | -- |

(OR)

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

| Item | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Weight Wi/Unit(in tons) | 2 | 1 | 4 | 3 |
| Return ri/Unit (in rupees) | 1000 | 400 | 2100 | 1400 |

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### SUB: Water Supply Engineering ( CE )

Time: 3 Hours                                                    Max. Marks: 70

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

### UNIT - I

1. (a) Explain the role of environmental engineering                                7M
   (b) What is Per capita demand? Explain the factors affecting Per capita demand of water.   7M

(OR)

2. (a) How the total quantity of water required by a town is estimated? Discuss in detail.   7M
   (b) Estimate the population of a city for the years 2041 using any two methods of population forecasting, based on the census data given below.   7M

| Year | 1961 | 1971 | 1981 | 1991 | 2001 | 2011 |
|------|------|------|------|------|------|------|
| Population | 160000 | 198000 | 250000 | 345000 | 410000 | 580000 |

### UNIT – II

3. (a) What are the various sources of water? Explain the suitability of surface sources of water with reference to quantity and quality.   8M
   (b) Explain the impurities in water                                              6M

(OR)

4. (a) Explain the physical characteristics of water                               7M
   (b) Explain the drinking water quality standards as per IS 10500                 7M

### UNIT – III

5. (a) Design a circular sedimentation tank to treat 5MLD of water                 7M
   (b) Explain the principle of coagulation process.                               7M

(OR)

6. (a) With a neat sketch, explain the working principle of rapid sand filter      7M
   (b) What is chlorination? Explain the importance of break point chlorination in determining dosage of disinfectant.   7M

### UNIT – IV

7. (a) Explain the principles and functions of aeration.                           7M
   (b) Explain the methods of water softening                                      7M

(OR)

8. (a) Discuss in brief rain water harvesting methods                              7M
   (b) What are the common methods employed in desalination? Describe any one in detail   7M

### UNIT-V

9. (a) Explain the systems of layouts for water distribution.                      7M
   (b) With a neat sketch, explain the various types valves.                       7M

(OR)

10. (a) Derive the Hardy-Cross equation for network analysis of distribution pipes   7M
    (b) Explain the systems of plumbing for house drainage                          7M

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### 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) Explain in brief, water requirements of cement.                               7M
   (b) Classify various types of mineral admixtures and discuss in detail about them.   7M

(OR)

2. Explain dry process of manufacturing the cement with neat diagram. Explain   14M
   advantages over the wet process.

### UNIT – II

3. (a) Classify aggregates based on shape with example.                            7M
   (b) Define workability of concrete? Name different tests procedures to test workability of   7M
   concrete?

(OR)

4. (a) Explain the significance of curing ?Discuss various curing methods applied to concrete   7M
   (b) What is segregation of bleeding? How they affect concrete?                     7M

### UNIT – III

5. (a) Identify the factors influencing creep of concrete and write a short note on them.   7M
   (b) Discuss in detail, about stress strain curve of concrete.                     7M

(OR)

6. (a) Explain measurement of creep in concrete with loading diagram.               7M
   (b) Define shrinkage and Explain different types of shrinkage.                    7M

### UNIT – IV

7. (a) Relate strength of concrete and water cement ratio. Discuss their correlation.   7M
   (b) Discuss the effect of following, on strength of concrete                      7M
       i)  Maturity concept     ii) Size of aggregate

(OR)

8. Explain in detail, the procedure to evaluate compressive strength test on concrete.   14M

### UNIT-V

9. Design M40 grade concrete according to IS 10262-2009 using BIS method for the   14M
   following data
   (i) slump 75mm,                         (ii) Quality control: good
   (iii) Exposure condition: Severe,        (iv) Maximum cement content: 450kg/m$^3$
   (v) Specific gravity of cement: 3.12,    (vi) Specific gravity of fine aggregate: 2.6
   (vii) Specific gravity of course aggregate: 2.72
   (viii) Sand zone III as per IS 383-2016
   Assume any missing data suitably

(OR)

10. (a) Explain about Mix design and its practical necessity.                        7M
    (b) Explain in detail various steps involved in designing concrete mixes using I.S.I   7M
    method

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: Hydrology ( CE )*

Time : 3 Hours                                                      Max. Marks: 70

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

## UNIT - I

1. (a) Describe the hydrologic cycle. Explain briefly the man's interference in various part of this cycle.    7M

   (b) A catchment has six rain gauge station. In a year, the annual rainfall recorded by the gauges are as follows:    7M

   | Station | A | B | C | D | E | F |
   |---------|-----|-------|-------|-------|------|-------|
   | Rainfall(cm) | 82.6 | 102.9 | 180.3 | 110.3 | 98.8 | 136.7 |

   For a 10% error in the estimation of the mean rainfall, calculate the optimum number of station in the catchment.

(OR)

2. (a) What is meant by probable maximum precipitation (PMP) over a basin? Explain how PMP is estimated?    7M

   (b) The normal annual rainfall at station A, B, C And D in a basin are 80.97, 67.59, 76.28 and 92.01 cms respectively. In the year 1975, the station D was inoperative and the station A, B And C recorded annual precipitation of 91.11, 72.23 and 79.89 cm respectively. Estimate the rainfall at station D in that year.    7M

## UNIT – II

3. (a) Explain briefly the evaporation process.    7M

   (b) A reservoir had an average surface area of 20 $Km^2$ during June 1982. In that month the mean rate of inflow = 10 $m^3$ /s, outflow= 1 $m^3$/s, monthly rainfall=10 cm and change in storage = 16 million $m^3$. Assuming the seepage losses to be 1.8 cm, estimate the evaporation in that month.    7M

(OR)

4. (a) Describe the factors affecting the evapotranspiration process.    7M

   (b) For an area in south India (latitude = $12^0N$), the mean temperature are given    7M

   | Month | june | july | aug | sep | Oct |
   |-------|------|------|------|------|------|
   | Temp($^0C$) | 31.5 | 31.0 | 30.0 | 29.0 | 28.0 |

   Calculate the seasonal consumptive use of the rice cop in the season June 16 to October 15, by using the Blaney-Criddle formula.

## UNIT – III

5. (a) Sketch a typical flow mass curve and explain how it could be used for the determination of the minimum storage needed to meet a constant demand.    7M

   (b) Why base flow is separated from the flood hydrograph in the process of developing a unit graph?    7M

(OR)

6. (a) What are the factors to be considered in locating a stream gauging site?    7M

   (b) A basin has 400 sq. km of area, L=35 km and $L_{ca}$=10 km. assuming $C_t$=1.5 and $C_p$=0.75 develop a 3-h synthetic unit hydrograph for the basin using Snyder's method.    7M

## UNIT – IV

7. The maximum rainfall intensity of 50 year return period over a region is given by $I$ 14M $= \frac{52}{(t+8)^{0.40}}$, where $I$ is cm/hr and t is duration in minutes. For a watershed of 50 km$^2$ in this region with a concentration time of 2 hours, estimate the flood peak using rational formula. Assume the runoff co-efficient C=0.55.

(OR)

8. (a) Define flood routing. What are the uses of flood routing? 7M

(b) What do you understand by the frequency factor? How is it determine for Gumbel's distribution? 7M

**UNIT-V**

9. (a) What is the difference between Confined aquifer and un-confined aquifer? Draw a neat sketch showing aquifer details. 7M

(b) A well penetrates in the centre of an unconfined aquifer bounded externally by a circle of radius 600 m along which the height of water table is 8 m. If at a distance of 10 m from the centre of well, the height of the water table is 7.5 m when steady conditions are established. Determine the discharge of the well. Take $K = 10^{-4}$ m/sec. 7M

(OR)

10. (a) What are the advantages of groundwater compared to surface water? 7M

(b) A well of 0.5 m diameter penetrates fully into a confined aquifer of thickness 20 m and hydraulic conductivity $8.2 \times 10^{-4}$ m/s. What is the maximum yield expected from this well if the drawdown in the well is not to exceed 3 m. The radius of influence may be taken as 260 m. 7M

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### SUB: Geotechnical Engineering - II ( CE )

Time : 3 Hours                                                                 Max. Marks: 70

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

## UNIT - I

1.  (a) Explain the scope and objectives of soil exploration.                                      7M
    (b) Describe static cone penetration test.                                                      7M

(OR)

2.  (a) Discuss with neat sketches any two boring methods used in soil exploration.                 7M
    (b) Discuss the salient features of soil investigation report.                                  7M

## UNIT – II

3.  (a) Explain different types of retaining walls.                                                 7M
    (b) A smooth backed vertical wall is 6.3 m high and retains a soil with a unit weight of        7M
        18 kN/m$^3$ and $\varphi = 18^o$. The top of the soil is level with the top of the wall and is
        horizontal. If the soil surface carries a surcharge of 4.5 kN/m$^2$, determine the
        magnitude of total active thrust.

(OR)

4.  (a) Differentiate between Rankine's and Coulomb's earth pressure theories.                      7M
    (b) A smooth vertical wall 6 m high retains a soil with c = 25 kN/m$^2$, $\gamma$ = 18 kN/m$^3$ and   7M
        $\varphi = 25^o$. The horizontal backfill surface carries a uniform surcharge load of 50 kN/m$^2$.
        Draw the active earth pressure distribution diagram.

## UNIT – III

5.  (a) Derive the Terzaghi's equation for ultimate bearing capacity of shallow foundation.          9M
    (b) Discuss the types of foundations and their selection with respect to different              5M
        situations.

(OR)

6.  (a) Discuss the methods for the determination of safe bearing pressure based on                 7M
        standard penetration number.
    (b) A square footing carries a load of 600 kN and is located at a depth of 1.2 m below the      7M
        ground level. The foundation soil properties are  c = 20 kN/m$^2$, $\gamma$ = 17.2 kN/m$^3$ and $\varphi$
        = 25$^o$. Determine the suitable size of foundation with factor of safety of 3.0. Terzaghi's
        bearing capacity factors are $N_c$ = 14.8 , $N_q$ = 5.6 , $N_\gamma$ = 3.2.

## UNIT – IV

7.  (a) Outline the procedure to determine the bearing capacity of a single driven pile and         10M
        that of a group of piles in a thick layer of clay.
    (b) A reinforce concrete pile weighing 30 kN (inclusive of helmet and dolly) is driven by       4M
        a drop hammer weighing 40 kN and having an effective fall of 0.8 m. The average set
        per blow is 1.4 cm. The total temporary elastic compression is 1.8 cm. Assuming the
        coefficient of restitution as 0.25 and a factor of safety of 2, determine the ultimate
        bearing capacity and the allowable load for the pile.

(OR)

8. (a) Discuss the settlement of pile groups and negative skin friction. 10M
   (b) Explain the types of piles based on materials and composition. 4M

**UNIT-V**

9. (a) Explain the Swedish circle method of stability analysis of finite slopes. 7M
   (b) An embankment is inclined at an angle of $35^\circ$ and its height is 15 m. The angle of shearing resistance is $15^\circ$ and the cohesion intercept is 200 $kN/m^2$. The unit weight of soil is 18 $kN/m^3$. If Taylor's stability number is 0.06, find the factor of safety with respect to cohesion. 7M

(OR)

10. (a) Discuss the types of slopes and slope failures. 7M
    (b) A 6 m deep cut is to be made in cohesive soil with a slope of 1:1. The soil has c = 30 $kN/m^2$, $\varphi = 10^\circ$ and $\gamma = 18$ $kN/m^3$. Find the factor of safety with respect to cohesion. What will be the critical height of the slope in this soil. Take Taylor's stability number as 0.108. 7M

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### SUB: Mechanics of Materials - II  ( CE )

Time : 3 Hours                                                                                    Max. Marks: 70

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

### UNIT - I

1. (a) Derive an expression for a member subjected to direct stress in one plane.    7M
   (b) A rectangular element in a strained body is subjected to tensile stresses of 250N/mm$^2$ and 180 N/mm$^2$ on mutually perpendicular planes together with a shear stress of 80N/mm$^2$. Determine:    7M
   i) Principal stresses ,              ii) Principal planes
   iii) Maximum shear stress and    iv) Plane of maximum shear stress

(OR)

2. Derive an expression for the major and minor principle stresses on an oblique plane when the body is subjected to direct stresses in two mutually perpendicular directions.    14M

### UNIT – II

3. Derive Lame's equation for thick cylinder.    14M

(OR)

4. (a) A cylindrical pipe of diameter 1.5m and thickness 1.5cm is subjected to an internal fluid pressure of 1.2 N/mm$^2$.  Determine    7M
   i. Longitudinal stress developed in the pipe and
   ii. Circumferential stress developed in the pipe.
   (b) A cylinder of internal diameter of 2.5m and of thickness 5cm contains a gas. If the tensile stresses in the material is not to exceed 80 N/mm$^2$. Determine the internal pressure of the gas.    7M

### UNIT – III

5. (a) Derive an expression for Euler's load or critical load formula for columns with both ends hinged.    7M
   (b) A column of circular section has 160mm diameter and 4m length. Both ends of the column are fixed. The column carries a load of 150 kN at an eccentricity of 15mm from the geometrical axis of the column. Find the maximum compressive stress on the column section. Find the resultant stresses when a column of rectangular section is subjected to eccentric loading in one side.    7M

(OR)

6. (a) Derive the Prof. Perry's formula.    7M
   (b) Derive secant formula for columns under eccentric loading?    7M

### UNIT – IV

7. (a) A column of circular section has 160mm diameter and 4 m length. Both ends of the column are fixed. The column carries a load of 150 kN at an eccentricity of 15mm from the geometrical axis of the column. Find the maximum compressive stress on the column section.    7M
   (b) What do you mean by direct and bending stress? Give the stresses acting in chimney.    7M

(OR)

8. Determine the stresses in case of Retaining wall with suitable example.    14M

### UNIT-V

9. Determine the principal moments of Inertia for an angle section 225 x175 x15 mm.    14M

(OR)

10. Determine the stresses and deflection for the mid section of the L beam by Un symmetrical method. Also identify the position of the neutral axis.    14M

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### SUB: Signals & Systems ( EEE )

Time : 3 Hours                                                    Max. Marks: 70

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

### UNIT - I

1. (a) Explain the following operations on signals in detail                    7M
        i) Time Shifting        ii) Time reversal        iii) Addition
   (b) Write short notes on Dirichlet's conditions for Fourier series.          7M

(OR)

2. (a) Discuss about Elementary signals with necessary functional and graphical  7M
       representations.
   (b) Describe representation of function by a set of mutually orthogonal functions  7M

### UNIT – II

3. (a) Obtain the Fourier transform of signal $x(t)=e^{-A|t|}$ sgn(t)           7M
   (b) State and prove Parseval's Relation of Fourier Transform                 7M

(OR)

4. (a) Elucidate the following Properties of Fourier Transform                  6M
       i) Linearity ii) Differentiation iii) Convolution
   (b) Determine the Fourier Transform for double exponential pulse whose function is  8M
       given by $x(t) = e^{-2|t|}$. Also draw its magnitude and phase spectra.

### UNIT – III

5. (a) Discuss in detail about Causality & Stability concepts                   7M
   (b) Evaluate Transfer function of a LTI system                               7M

(OR)

6. (a) Find whether the following systems are causal or non-causal             6M
       i) y(t)=x(-t)    ii) y(t)=x(t+10)+x(t)    iii) y(t)=x(t) sin(t+1)
   (b) Enlighten Transmission of signals through LTI systems                    8M

### UNIT – IV

7.    Define Sampling. Derive the sampling theorem and explain how the original signal  14M
      can be reconstructed from the sampled version.

(OR)

8. (a) Explain the concept of Linear Shift Invariant(LSI) system               7M
   (b) What is DTFT? Discuss System analysis using DTFT                         7M

### UNIT-V

9. (a) Find the Inverse Laplace Transform for $X(s) = 2/(s^2+3s+2)$            6M
   (b) State and Prove initial value theorem and final value theorem for Laplace transform  8M

(OR)

10. (a) Explain any three properties of Z-Transforms in detail                  7M
    (b) Find Inverse Z-Transform $H(z)= 1 + z^{-1} + z^{-3}$, ROC, $|z|> 0$     7M

## K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
### B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: Electrical Machines - III ( EEE )*

Time : 3 Hours                                                                                    Max. Marks: 70

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

### UNIT – I

1.  (a)  List out the advantages of stationary armature and rotating field system in an alternator.   6M

    (b)  The flux distribution curve of a smooth core, 50 Hz generator is   8M
    $B=10Sin\theta+2Sin3\theta+2Sin5\theta+2Sin7\theta$ kilo-gauss when '$\theta$' is measured from the neutral axis. The pole pitch is 35 cm, core length is 32 cm and the stator coil span is $4/5^{th}$ of pole pitch. Determine the equation for the emf induced in one turn and its rms value.

(OR)

2.  (a)  Define armature reaction. Explain the effect of armature reaction on the terminal   8M
    voltage of an alternator at UPF, ZPF lagging power factor and ZPF leading power factor loads. Draw the relevant phasor diagrams.

    (b)  A 3-phase star connected alternator is rated 1600 kVA, 13,500 V. Its armature effective   6M
    resistance and synchronous reactance are 1.5 ohms/ph and 30 ohm/ph respectively. Calculate the percentage regulation for a load of 1280 kW at p.f. of
    (i) 0.8 lead     (ii) 0.8 lag     and     (iii) UPF.

### UNIT – II

3.  (a)  Describe the slip test method for the measurement of $X_d$ and $X_q$ of salient pole   10M
    synchronous machine. Upon what factors do these values depend?

    (b)  A 3-phase Y-connected synchronous generator supplies current of 10A having phase   4M
    angle of $20^o$ lagging at 400V. Find the load angle and direct axis and quadrature axis components of armature current if $X_d$ =10 $\Omega$/ph. and $X_q$ = 6.5 $\Omega$/ph. Assume armature resistance to be negligible.

(OR)

4.  (a)  Explain Blondel's two-reaction theory applicable to salient pole alternators.   10M

    (b)  Why $X_d$ and $X_q$ are different for salient pole alternators whereas they are same for   4M
    smooth cylindrical rotor alternators?

### UNIT – III

5.  A synchronous generator is connected to an infinite bus. Discuss with the help of phasor   14M
    diagrams
    (i) effect of change in excitation at constant mechanical input
    (ii) effect of change in the mechanical input at constant excitation

(OR)

6. (a) What is an infinite bus-bar? Explain the operating characteristics of an alternator connected to an infinite bus.    6M

(b) Two 3-phase synchronous mechanically coupled generators operate in parallel on the same load. Determine the kW output and power factor of each machine under the following conditions. Synchronous impedance of each generator: $(0.2+j2)\Omega$/phase. Equivalent impedance of the load: $(3+j4)\Omega$/phase, induced emf per phase: $(2000+j0)$ volts for machine-1 and $(2200+j100)$ volts for machine-2.    8M

## UNIT – IV

7. (a) Describe the effect of varying the excitation on the armature current and power factor of a synchronous motor when input power to the motor is maintained constant.    10M

(b) A 3-phase synchronous motor absorbing 60 kW is connected in parallel with a factory load of 240 kW having lagging pf of 0.8. If the combined load has a pf of 0.9 lagging, what is the value of leading kVAR supplied by the motor & at what power factor it is working?    4M

(OR)

8. (a) Show that the current locus of a synchronous motor developing constant power is a circle. Determine its center and radius.    10M

(b) Explain two important functions of damper windings in a synchronous motor.    4M

## UNIT-V

9. (a) Describe the construction and principle of operation of a single phase shaded pole motor with a neat diagram. Give its industrial applications.    8M

(b) Compare various types of single phase induction motors in terms of construction and performance.    6M

(OR)

10. (a) Using double revolving field theory, explain the torque-slip characteristic of a single phase induction motor and prove that it cannot produce staring torque.    8M

(b) Explain the constructional details and principle of operation of a split phase induction motor. List out its industrial applications.    6M

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
### B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: Power Systems - II ( EEE )*

Time : 3 Hours　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

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

### UNIT - I

1. (a) Explain the following terms:　　　　　　　　　　　　　　　　　　　8M
    (i) Surge impedance,　　　　　(ii) Velocity of propagation
    (iii)　Phase constant and　　　　(iv) Attenuation constant

   (b) A three-phase voltage of 11 kV is applied to a line having R=8 Ω and X= 11 Ω per　6M
   conductor. At the end of the line, a balanced load of '*P*' kW per phase at leading
   power factor is connected. At what value of '*P*' is the voltage regulation zero when
   the power factor of the load is (1) 0.707 and (2) 0.8?

(OR)

2. A three-phase 50 Hz, 90 km long overhead line has the following line constants:　14M
   Resistance per kilometer = 0.15 Ω Inductance per kilometer = 1.2 mH
   Capacitance per kilometer = 0.009 μF
   The line supplies 25 MW at 0.85 power factor (lag) and 170 kV. Using nominal Π-
   representation, calculate the sending end voltage, current, power factor, regulation
   of the line and the efficiency of transmission.

### UNIT – II

3. (a) Explain in brief the procedure to form reactance diagram from the single line　6M
   diagram.

   (b) Draw an impedance diagram for the three-phase system shown in Figure 1,　8M
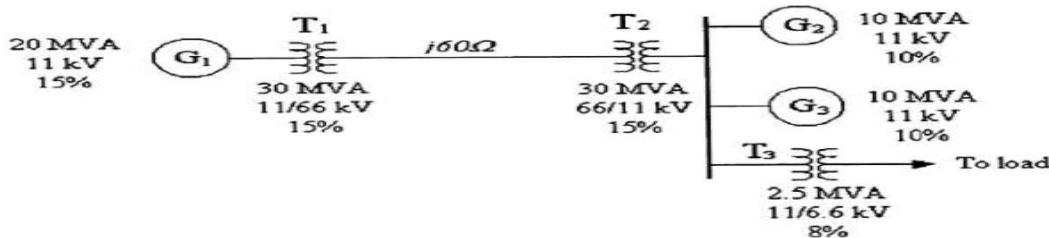   expressing all values as per-unit quantities on a 50 kVA base.



Fig.1

(OR)

4. A portion of a power system consists of two generators in parallel, connected to a　14M
   step-up transformer that links them with a 230-kV transmission line. The ratings of
   these components are:

   Generator $G_1$: 10 MVA, 12 percent reactance Generator $G_2$: 5 MVA, 8 percent
   reactance , Transformer: 15 MVA, 6 percent reactance

   Transmission line: (4+j60) Ω, 230 kV where the percentage reactance are computed
   on the basis of the individual component ratings. Express the reactance and the
   impedances in percent with 15 MVA as the base value.

### UNIT – III

5. Figure 2 shown below shows a power system, where load at bus 5 is fed by　14M
   generators at bus 1 and bus 4. The generators are rated at 100 MVA; 11 kV with
   subtransient reactance of 25%. The transformers are rated each at 100 MVA,
   11/112 kV and have a leakage reactance of 8%. The lines have an inductance

of 1mH/phase/km, Line $L_1$ is 100 km long while lines $L_2$ and $L_3$ are each of 50 km in length. Find the fault current and MVA for a three phase fault at bus 5.
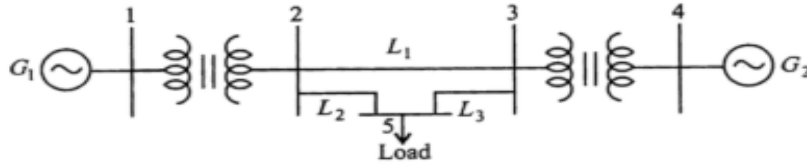


Fig.2

(OR)

6.  A power station with two generators feeds a transmission system operating at 132  **14M**
kV through transformers as shown in Fig. 3. The far end of the transmission system consisting of 200 km long double-circuit line is connected to load from bus B. If a three-phase fault occurs at bus B, determine the total fault current supplied by each generator. Select 75 MVA and 11 kV on the LV side and 132 kV on the HV side as the base values.
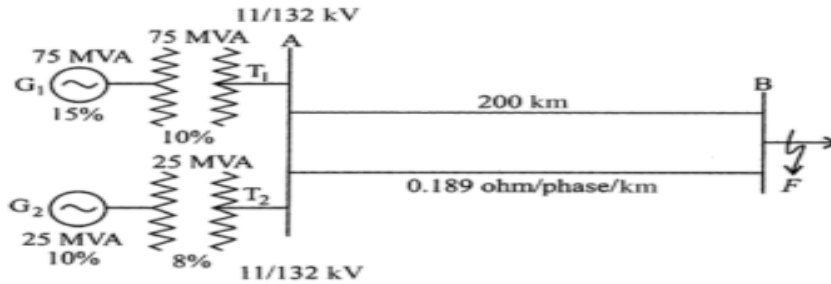


Fig. 3

## UNIT – IV

7.  (a)  Explain in brief the importance of short circuit studies in power system.  **6M**

(b)  Draw the negative and zero sequence impedance diagrams for different 3-phase transformer winding connections.  **8M**

(OR)

8.  Three 11 kV; 20 MVA 3 phase synchronous generators are connected to common  **14M**
set of bus bars. Each machine has a reactance to positive sequence currents of 20%. The reactance to negative and zero sequence currents are 15% and 30% respectively. If an earth fault occurs on one busbar determine the fault current.

(a) If all the generator neutrals are solidly earthed.

(b) If one of the generator neutral is solidly earthed and the others are isolated.

(c) If one of the generator neutral is earthed through a resistance of 0.5 Ω and the other neutral points are isolated.

## UNIT-V

9.  (a)  Write short notes on  **8M**
(i)     Transformer earthing,        (ii) Resonant grounding

(b)  Determine the inductance of Peterson coil to be connected between the neutral and  **6M**
ground to neutralize the charging current of overhead line having the line to ground capacitance of 0.15 µF. If the supply frequency is 50 Hz and the operating voltage is 132 kV, Find the kVA rating of the coil.

(OR)

10.  (a)  Explain in brief about driven rod and derive the expression for earthing resistance  **8M**
of it.

(b)  Explain the terms touch potential and tolerable step.  **6M**

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### SUB: Power Electronics ( EEE )

Time : 3 Hours          Max. Marks: 70

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

### UNIT - I
1. (a) Sketch the V-I Characteristics of SCR device. Explain the significance of (i) Latching current (ii) Holding current (iii) Forward breakover voltage (iv) Finger voltage   8M
   (b) A thyristor is triggered by a pulse of 5 kHz whose duty ration is 0.5. If the allowable gate power is 100W, calculate the maximum allowable gate drive power.   6M

(OR)

2. (a) Plot and explain the dynamic turn on characteristics of SCR.   7M
   (b) Plot and explain the dynamic turn off characteristics of SCR.   7M

### UNIT – II
3. (a) What is phase control rectifier? Explain the inversion operation of single phase fully controlled converter with R-L load.   8M
   (b) A single-phase fully controlled bridge circuit is used for obtaining regulated DC output voltage. The supply AC input is 220V and the firing angle is maintained at $30°$ so that the load current is 5 A. Calculate DC output voltage, active and reactive power input   6M

(OR)

4. (a) Explain the effect of source inductance for rectification action of single phase fully controlled converter with RL load with relevant waveforms.   7M
   (b) Compare non-circulating and circulating current mode in dual converters.   7M

### UNIT – III
5. (a) Explain the single-phase AC voltage controller with resistance load and derive the expression for RMS output voltage?   7M
   (b) Explain the operation of single-phase cyclo-converter with resistance load by choosing out frequency as one half of the supply frequency.   7M

(OR)

6. (a) Analyze the operation of TRIAC device with RL load. Derive the RMS ac output voltage.   7M
   (b) Explain the bridge configuration of single phase cyclo-converter with RL load for an output frequency of one third of the supply frequency.   7M

### UNIT – IV
7. (a) Explain the various control strategies for a DC chopper.   8M
   (b) A chopper circuit working on time ratio control principle is operating at a frequency of 1kHz on 230V dc supply, if load voltage is 160V, calculate conduction and blocking period of SCR in each cycle.   6M

(OR)

8. (a) Explain the principle of type A and type B choppers.   7M
   (b) Explain the principle of operation of multiphase chopper   7M

### UNIT-V
9. (a) Explain the operation of single-phase bridge type inverter with R and RL loads. Derive the RMS output voltage.   7M
   (b) Explain any two forced commutation circuits for bridge inverters.   7M

(OR)

10. (a) Explain the operation of basic series inverter with relevant output waveforms.   7M
    (b) Discuss the various control techniques of single-phase inverters.   7M

## K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
### B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: Control Systems ( EEE )*

Time : 3 Hours                                                           Max. Marks: 70

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

### UNIT - I

1.  (a)  Discuss the advantages and disadvantages of open and closed loop control systems.     4 M
    (b)  Write the differential equations governing the mechanical system shown in Fig.1.   10 M
         Draw the force –voltage analogous circuit and verify by writing mesh equations.



Fig.1

(OR)

2.  (a)  What are the characteristics of feedback control systems?                               4 M
    (b)  Write the differential equations governing the mechanical system shown in fig 2.       10M
         Draw the force-voltage analogous circuit and verify by writing mesh equations.



Fig.2

### UNIT – II

3.  (a)  Derive the transfer function of field controlled DC motor.                             7M
    (b)  Determine the overall transfer function for the system shown in fig.3.                 7M



Fig.3

(OR)

4.  (a)  Explain the working principle of AC servo motor.                                       6M

(b)  For the signal flow graph shown below fig.4 using Mason's gain formula obtain X2/X1.    8M



Fig.4

**UNIT – III**

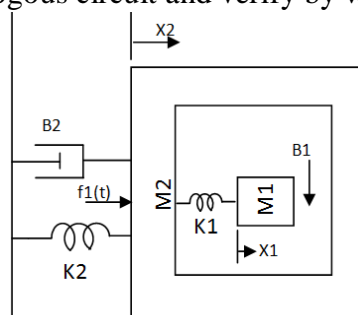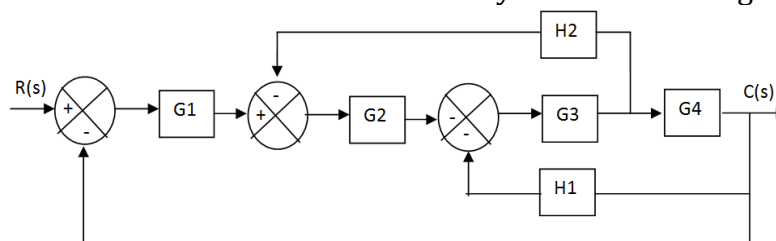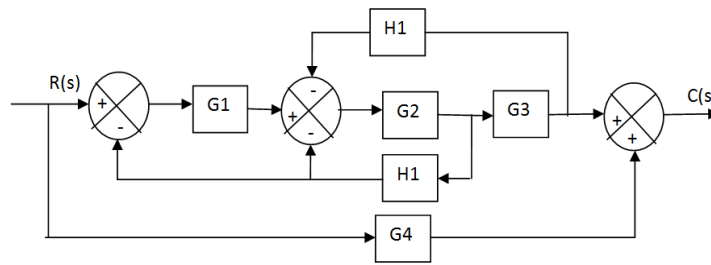5.  (a)  Derive the expressions for peak time and settling time of standard second order system when subjected to a unit step input.    7M

(b)  The open loop transfer function of unity feedback system is given by $G(S) = \dfrac{K}{s(sT+1)}$    7M

where K and T are positive constants. By what factor should the amplifier gain K be reduced, so that the peak overshoot of the unit step response of the system is reduced from 75% to 25%.

(OR)

6.  (a)  Describe the procedure to construct root locus.    7M

(b)  By means of Routh criterion, determine the stability of the system represented by the characteristic equation $S^4 + 8S^3 + 18S^2 + 16S + 5 = 0$. Comment on the location of the roots of the characteristic equation.    7M

**UNIT – IV**

7.  Draw the bode plot for system having $G(s)H(s) = \dfrac{80(S+5)}{S^2(S+50)}$ find    14M

(a) gain margin                          (b)phase margin
(c) gain crossover frequency            (d) phase cross over frequency
also determine the value of k for a phase margin of 45°

(OR)

8.  (a)  What is gain margin and phase margin? How stability analysis can be done using Bode plots?    6M

(b)  Construct the Nyquist plot for a system whose open loop transfer function is given by    8M

$G(s)H(s) = \dfrac{K(1+S)^2}{S^3}$ find the range of values of K for which the system remains stable.

**UNIT-V**

9.  (a)  What are the different types of compensation?    4 M

(b)  Explain the realization of Lag Compensator using electrical network and draw the frequency response.    10M

(OR)

10.  (a)  Explain how the compensators are selected.    4 M

(b)  Design a lead compensator for a unity feedback system with open loop transfer    10M

function $G_f(s) = \dfrac{K}{S(S+1)}$ for specification of $K_v=10S^{-1}$ and $\phi_m=35°$

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

**B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019**

*SUB: Managerial Economics & Financial Analysis ( EEE )*

Time : 3 Hours                                             Max. Marks: 70

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

### UNIT - I

1.  Evaluate survey and statistical based demand forecasting methods with appropriate examples

(OR)

2.  Define managerial Economics .,Explain Nature and scope of managerial Economics

### UNIT – II

3.  Write short note on :
    (a) Cobb – Douglas production function.
    (b) Internal and external economics scale

(OR)

4.  State the breakeven analysis? Explain objectives, importance and show the graphical representation of BEP.

### UNIT – III

5.  What is monopoly? Explain price out- put determination in long run and short run .

(OR)

6.  Explain the price output determination in short run and long run in case of perfect competition

### UNIT – IV

7.  (a) Calculate the net present value of two projects and suggest which of the projects should accepted assuming a discount rate of 10%.

|                   | Project A  | PROJECT B  |
|-------------------|------------|------------|
| Initial Investment | Rs 30000   | Rs 50000   |
| life              | 5 years    | 5 years    |
| Scrap value       | Rs 2000    | Rs 4000    |

(b)

| Years               | 1     | 2     | 3     | 4    | 5    |
|---------------------|-------|-------|-------|------|------|
| Project A Cash In Flow | 10000 | 15000 | 8000  | 6000 | 4000 |
| Project B Cash In Flow | 40000 | 30000 | 10000 | 5000 | 4000 |

(OR)

8.  What are the advantages and disadvantages of partnership business?

### UNIT-V

9.  Briefly discuss accounting concepts and conventions with examples

(OR)

10. Define ratio analysis? Explain advantages and disadvantages of ratio analysis

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: DIGITAL IC APPLICATIONS ( ECE )*

Time : 3 Hours　　　　　　　　　　　　　　　　　　Max. Marks: 70

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

### UNIT - I

1. (a) Draw the circuit diagram of basic CMOS gate and explain the operation.
   (b) Draw the circuit diagram of ECL and explain its operation.

(OR)

2. (a) Explain the following terms with reference to CMOS logic:
   (i) Logic '0' and logic '1'.　　　　(ii) Noise margin.
   (iii) Power supply rails.　　　　　(iv) Propagation delay.
   (b) Implement the following logic expression with CMOS AOI logic and explain its operation with the help of functional table. $Y = \overline{AB.CD}$

### UNIT – II

3. (a) Explain the difference in program structure of VHDL and any other procedural language. Give an example.
   (b) Explain the behavioural design model of VHDL.

(OR)

4. (a) What are different data types available in VHDL? Explain.
   (b) Explain the structure of various LOOP statements in VHDL with examples.

### UNIT – III

5. (a) Design the logic circuit and write a data-flow style VHDL program for the following function. $f(Y) = \Pi A, B, C, D\ (3, 5, 6, 7, 13) + d(1, 2, 4, 12, 15)$
   (b) Describe three state devices.

(OR)

6. (a) Design a 16x1 multiplexer using two 74x151 multiplexer and one 74x139 decoder. Write a VHDL program for the above design.
   (b) Draw the logic circuit for binary to BCD Code convertor and write a VHDL program for the above design.

### UNIT – IV

7. (a) Draw the two bit comparator circuit and explain its operation. write a VHDL program for the above design.
   (b) Write short notes on Dual Priority Encoder in detail.

(OR)

8. (a) Draw the circuit diagram of Floating-Point Encoder with relevant digital IC and explain its operation.
   (b) Write a VHDL program for 16-bit comparator.

### UNIT-V

9. (a) Design a Mod-10 Counter using Digital IC and explain its operation along with output wave forms.
   (b) What is Race around condition and how to avoid it? Convert JK flip flop to T flip flop with circuit diagram?

(OR)

10. (a) List out the comparisons of PLA and PAL with examples.
    (b) Write VHDL data-flow program for the above shift-register.

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: COMPUTER ORGNIZATION (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) | Describe basic functional units of computer with a neat sketch. | 7M |
| | (b) | Explain in detail the parameters to measure performance of a computer. | 7M |

(OR)

| | | | |
|---|---|---|---|
| 2. | (a) | Illustrate and explain bus and memory transfers. | 7M |
| | (b) | Explain in detail about Binary adder and Binary subtractor arithmetic micro operations with example. | 7M |

### UNIT – II

| | | |
|---|---|---|
| 3. | Explain briefly about various phases of instruction cycle with a neat sketch. | 14M |

(OR)

| | | | |
|---|---|---|---|
| 4. | (a) | Explain address sequencing in detail. | 10M |
| | (b) | Illustrate and explain computer hardware configuration. | 4M |

### UNIT – III

| | | |
|---|---|---|
| 5. | Explain various addressing modes in detail with example. | 14M |

(OR)

| | | |
|---|---|---|
| 6. | Explain the process of pipelining with example. | 14M |

### UNIT – IV

| | | |
|---|---|---|
| 7. | Explain Input-Output interface in detail with example. | 14M |

(OR)

| | | |
|---|---|---|
| 8. | Define priority interrupt. Explain various priority interrupt with example. | 14M |

### UNIT-V

| | | | |
|---|---|---|---|
| 9. | (a) | Describe briefly about the memory hierarchy in computer system. | 6M |
| | (b) | Explain in detail about memory mapping in cache memory. | 8M |

(OR)

| | | |
|---|---|---|
| 10. | Illustrate and explain various interconnection structures of multiprocessors. | 14M |

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: ANTENNA AND WAVE PROPAGATION (ECE)*

Time : 3 Hours                                                         Max. Marks: 70

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

### UNIT - I

1. (a) Explain the antenna parameters                                                    10M
   i) Radiation pattern ii) Beam area iii) Directivity iv) FBR  v) Radiation Intensity

   (b) The radiation resistance of an antenna is 72 Ω and the loss resistance is 8 Ω. What is   4M
   its directivity if the power gain is 16?

(OR)

2. Explain i) Antenna Temperature ii) Front to Back Ratio (iii) Retarded potential       14M
   iv) Fields from oscillating dipole v) Antenna Field zones

### UNIT – II

3. Explain in detail about Arrays of 2 Isotropic Sources?                                 14M

(OR)

4. (a) Write about Multiplication of pattern?                                             2M

   (b) Draw the radiation pattern of 8 isotropic elements fed in phase, spaced λ/2 apart   12M
   With the principle of pattern Multiplication?

### UNIT – III

5. Write brief notes on i) parabolic reflector antenna ii) Microstrip Antenna            14M

(OR)

6. (a) Explain in detail about a folded dipole antenna?                                    8M

   (b) Explain measurement of gain by direct comparison method?                            6M

### UNIT – IV

7. Write short notes on i) Fading and Path losses ii) Wave tilt  iii) Super refraction    14M

(OR)

8. (a) Explain about tropospheric propagation.                                            7M

   (b) Explain the effect of earth's curvature on wave propagation.                        7M

### UNIT-V

9. Write short notes on i) Critical frequency, ii) MUF,  iii) LUF, iv) OF, v) Virtual    14M
   height, vi) Skip Distance

(OR)

10. Discuss briefly about sky wave propagation and explain the terms                      14M
    (i) Maximum usable frequency (ii) virtual height (iii) Multi-Hop propagation

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
### B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: DIGITAL COMMUNICATIONS (ECE)*

Time: 3 Hours　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

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

### UNIT – I

1. (a) With neat block diagram, Explain the process of Sampling and Quantization in digital communication. — 7M
   (b) Explain about the noise in PCM systems. — 7M

(OR)

2. (a) Explain the comparison between TDM and FDM — 7M
   (b) Explain the working principle of Delta Modulation system — 7M

### UNIT – II

3. (a) Write short notes on cross talk and eye diagram — 7M
   (b) Explain Nyquist criterion — 7M

(OR)

4. (a) Explain modified duobinary signal scheme with the help of diagram — 7M
   (b) Represent the binary sequence 100111010 using the following formats — 7M
      i) Bipolar　　　　ii) Split Manchester code

### UNIT – III

5. (a) Draw the block diagram of digital communication system and explain each block in detail — 7M
   (b) Define the following: — 7M
      i) Shannon's Source Coding Theorem ii) Channel Capacity

(OR)

6. (a) Mention the advantages of digital communication over analog communication. — 7M
   (b) Explain the concept of entropy and its properties. — 7M

### UNIT – IV

7. (a) Write short notes on Hamming codes. — 7M
   (b) What are code tree, code trellis and state diagrams for convolution encoders? — 7M

(OR)

8. (a) Explain about Error detection and Correction capabilities of Hamming codes — 7M
   (b) Derive the steps involved in generation of linear block codes — 7M

### UNIT-V

9. (a) With neat diagrams and equations, explain about PSK system. — 7M
   (b) Give a comparison between FSK and PSK schemes. — 7M

(OR)

10. (a) Explain about DPSK system. And also give the comparison between DPSK and PSK — 7M
    (b) Explain coherent ASK and non coherent ASK schemes — 7M

## K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
### B.Tech. V Sem.(R15) Regular & Supple. Examinations of October/November 2019
### *SUB: LINEAR IC APPLICATIONS ( ECE )*

Time : 3 Hours                                                                                          Max. Marks: 70

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

### UNIT – I

| | | | |
|---|---|---|---|
| 1. | (a) | Write the properties of Different Configurations of Differential Amplifier. | 7M |
| | (b) | Explain the Block diagram of Operational amplifier with neat sketch. | 7M |

(OR)

| | | | |
|---|---|---|---|
| 2. | (a) | Explain Input Bias Current compensation with a neat diagram. | 7M |
| | (b) | Explain the Frequency compensation using pole-zero method. | 7M |

### UNIT – II

| | | | |
|---|---|---|---|
| 3. | (a) | With a neat sketch explain the OP-AMP differentiator circuit. | 7M |
| | (b) | Explain the operation of V to I and I to V converter. | 7M |

(OR)

| | | | |
|---|---|---|---|
| 4. | (a) | Explain the operation of AC amplifier using OP-AMP. | 7M |
| | (b) | Explain the operation of Sample and Hold circuit. | 7M |

### UNIT – III

| | | | |
|---|---|---|---|
| 5. | (a) | Explain the operation of the Triangular wave generator using op-amp. | 7M |
| | (b) | Derive the transfer function for the first order HPF, and also plot its frequency response. | 7M |

(OR)

| | | | |
|---|---|---|---|
| 6. | (a) | Explain the operation of the Schmitt Trigger using OP-AMP. | 7M |
| | (b) | Derive the transfer function for the second order Active filter, and also plot its frequency response. | 7M |

### UNIT –IV

| | | | |
|---|---|---|---|
| 7. | (a) | Draw the Functional Block diagram of 555 Timer & Explain its operation. | 7M |
| | (b) | Explain the working of IC 565 PLL. | 7M |

(OR)

| | | | |
|---|---|---|---|
| 8. | (a) | Explain the working of Astable multivibrator using 555Timer. | 7M |
| | (b) | Explain the working of Monostable multivibrator using 555Timer. | 7M |

### UNIT – V

| | | | |
|---|---|---|---|
| 9. | (a) | Explain the working of Inverted R-2R Ladder DAC. | 7M |
| | (b) | Explain the working of a Dual slope ADC converter. | 7M |

(OR)

| | | | |
|---|---|---|---|
| 10. | (a) | Explain the working of Counter type ADC. | 7M |
| | (b) | Explain the working of Successive Approximation ADC. | 7M |

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: MICROPROCESSORS AND INTERFACING ( ECE )*

Time : 3 Hours                                                                                    Max. Marks: 70

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

### UNIT - I

1.  (a) Describe Various Signals of Timing and Control Unit of 8085 Microprocessor?   8M
    (b) Write an 8085 Assembly Language Program to Multiply two 8 bit numbers and store   6M
        16 bit answer.

(OR)

2.  (a) Describe about interrupt control unit of 8085 Microprocessor?   8M
    (b) Identify addressing modes of the following Instructions   6M
        i) MOV A,M          ii) ADD B              iii) ADI 08H
        iv) IN 55H          v) XTHL                vi) LXI B,1122H

### UNIT – II

3.  (a) Explain BIU &EU of 8086?   8M
    (b) How many String Instructions are there in 8086 explain?   6M

(OR)

4.  (a) Explain Maximum mode Configuration along with pin Description?   8M
    (b) What are the Uses of Segment Registers?   6M

### UNIT – III

5.  (a) Write an 8086 ALP to add Even Numbers stored in an array   8M

    (b) Write an ALP to find 7-Segment Code using a Lookup Table?   6M

(OR)

6.  (a) Write an ALP to add two 64 bit Numbers?   8M
    (b) Write an ALP to find the Factorial of Number?   6M

### UNIT – IV

7.  (a) Draw the 8255 interfacing diagram with 8086 with address 00,01,02,03. ?   8M
    (b) Explain the CWR of 8255?   6M

(OR)

8.  (a) Draw the Block diagram of 8254     and explain different modes of operation?   8M
    (b) What is the difference between DMA & Interrupt data Transfer. ?   6M

### UNIT-V

9.  (a) Write an ALP to Rotate Stepper motor by 180 degrees in clockwise direction?   8M
    (b) Write an ALP to generate Triangular waveform from a DAC?   6M

(OR)

10. (a) Design a Traffic Light Contro, System Using 8086&8255?   8M
    (b) Draw Flow Chart/ALP to Control Traffic lights. ?   6M

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: Industrial Management ( ME )*

Time : 3 Hours　　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

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

### UNIT - I

1. (a) Identify an appropriate layout for each of the following situations. Justify your choice in a sentence or two:　　10M
   i) A manufacturer of garments for Van Heusen
   ii) A multi cuisine restaurant in a posh residential area in Mumbai.
   iii) The overhaul of helicopters.
   iv) A fabricator of custom made PCBs for a large number of electronic applications.
   v) An eye hospital.
   vi) A motor manufacturer manufacturing 4 product groups for worldwide markets.
   vii) A manufacturer of large turbines for power sector applications.
   (b) Define material handling? Explain principles of material handling?　　4M

(OR)

2. (a) Define plat layout and explain about product layout with advantages and limitations and applications.　　7M
   (b) Explain about bucket conveyors with neat sketches.　　7M

### UNIT – II

3. (a) Define the work study. State its objectives and benefits.　　7M
   (b) In what respect have Fayol's principles of management resulted in contributions to management methods that are different from the techniques of Taylor's scientific management?　　7M

(OR)

4. (a) What are the important factors effecting work study　　7M
   (b) Explain in detail on various principles of motion economy.　　7M

### UNIT – III

5. (a) What do you understand by work sampling? Explain the process for conducting duble sampling.　　7M
   (b) A time study was made of a punch press operator. The average observed time after discounting non normal occurrences was 0.52 minute per unit. The operator performance was judged to be 90 and the allowances for this type of work total 12 percent. What is the normal time and standard time for this job?　　7M

(OR)

6. (a) Assume that the total observed time for an operation of assembling an electric switch is 1 min, if the rating is 120%find normal time. If any allowances of 10% is allowed for the operation, determine the standard time.　　7M
   (b) State the advantages and limitations of stopwatch time over work sampling.　　7M

### UNIT – IV

7. (a) Briefly explain about CPM and PERT　　7M
   (b) What is Float? Discuss in brief different types of floats?　　7M

(OR)

8. A project management firm is preparing a network for one of the projects that it has recently bid for. The client demands that the project needs to be completed and delivered at its site by week 25. The firm has identified the list of activities to be performed and estimated the duration of each of the activities. The details are given in the table below. Use this information to draw a network and help the firm answer the following questions　　14M

   i) Will the firm be able to meet with the customer's dead line of 25 weeks?

ii) If the firm cannot, identify the set of activities that need to be considered for a possible reduction in duration.

iii) If the cost of reduction is RS 10000 per week and the firm will have to pay a penalty of Rs 7000 per week of delay in completion in addition to paying affixed amount of Rs 20000, what will your recommendation be to the firm with respect to reducing the duration?

| ACTIVITY | IMMEDIATE PREDECESSORS | DURATION (WEEKS) |
|----------|------------------------|------------------|
| A | - | 8 |
| B | A | 3 |
| C | A | 6 |
| D | A | 4 |
| E | B | 5 |
| F | B | 4 |
| G | C,E | 6 |
| H | D | 6 |
| I | F | 6 |
| J | D | 4 |
| K | G,H,I | 3 |
| L | J,K | 3 |

**UNIT-V**

9. (a) The following represents a project that should be scheduled using PERT          7M
   i) Draw the network
   ii) Identify its critical path and expected project completion time.
   iii) What is probability of completing this project within 35 days?

| ACTIVITY | IMMEDIATE PREDECESSORS | TIME (DAYS) | | |
|----------|------------------------|-------------|---|---|
| | | OPTIMISTIC TIME | MOST LIKELY TIME | PESSIMISTIC TIME |
| A | - | 10 | 22 | 28 |
| B | A | 4 | 4 | 10 |
| C | A | 4 | 6 | 14 |
| D | B | 1 | 2 | 3 |
| E | C | 1 | 5 | 9 |
| F | C,D | 7 | 8 | 9 |
| G | E,F | 2 | 2 | 2 |

(b) A manufacturer of garments wants to set up a quality control system using control charts for     7M
process control. The manufacturer has the three options to choose from:
i) Measure the critical dimensions of the garment for establishing its quality.
ii) Segregate every batch of production into good quality and seconds quality.
iii) Estimate the number of defects for bale of cloth issued for production
The manufacturer is not sure about what it means to choose which of the above. Prepare a report explaining the pros and cons of each of the choices, the nature of efforts required to setup control charts a nd implications of their use.

(OR)

10. (a) The following table gives the number of defects in a casting used for making crank case of a     10M
diesel engine.

| Casting no | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------------|---|---|---|---|---|---|---|---|---|----|
| Number of defects | 15 | 11 | 25 | 10 | 12 | 20 | 15 | 10 | 17 | 13 |

Construct a C-Chart with 3 sigma limits and comment on the casting process.

(b) Explain the procedure for construction of control charts for variables.          4M

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: Thermal Engineering - II ( ME )*

Time: 3 Hours                                                    Max. Marks: 70

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

## UNIT - I

| | | | |
|---|---|---|---|
| 1. | (a) | Explain Rankine cycle with *P-V* and *T-S* diagrams. | 4M |
| | (b) | A steam power plant is supplied with dry saturated steam at a pressure of 12 bar and exhausts into a condenser at 0.1 bar. Calculate the Rankine efficiency by using 1. Steam tables and 2. Mollier chart. | 10M |

(OR)

| | | | |
|---|---|---|---|
| 2. | (a) | Explain the concept of mean temperature of heat addition. | 4M |
| | (b) | Explain with the help of *P-V* and *T-S* diagrams, the sequence of operations in the modified Rankine cycle. | 10M |

## UNIT – II

| | | | |
|---|---|---|---|
| 3. | (a) | What is a steam boiler? How they are classified? | 4M |
| | (b) | The following observations were made in a boiler trail: Coal used 250 kg of calorific value 29800 kJ/ kg, water evaporated 2000 kg, steam pressure 11.5 bar, dryness fraction of steam 0.95 and feed water temperature $34^0$C. calculate the equivalent evaporation from and $100^0$ C per kg of coal and the efficiency of the boiler. | 10M |

(OR)

| | | | |
|---|---|---|---|
| 4. | (a) | Explain briefly the term boiler efficiency. | 4M |
| | (b) | Explain the various losses in a boiler and draw the heat balance sheet of a boiler. | 10M |

## UNIT – III

| | | | |
|---|---|---|---|
| 5. | (a) | Explain the function of nozzles used with steam turbines. | 4M |
| | (b) | Dry saturated steam at a pressure of 15 bar enters in a nozzle and is discharged at a pressure of 1.5 bar. Find the final velocity of the steam, when the initial velocity of is negligible. | 10M |

(OR)

| | | | |
|---|---|---|---|
| 6. | (a) | Explain various types of steam nozzles. | 4M |
| | (b) | Dry saturated steam at 10 bar is expanded isentropically in a nozzle to 0.1 bar. Using steam tables find the dryness fraction of the steam at exit. Also find the velocity of steam leaving the nozzle when 1.initial velocity negligible and 2.initial velocity of the steam is 135 m/s. | 10M |

## UNIT – IV

| | | | |
|---|---|---|---|
| 7. | (a) | What is a turbine? How does it differ from a steam engine? | 4M |
| | (b) | The velocity of steam, leaving the nozzles of an impulse turbine is 1200 m/s and the nozzle angle is $20^0$. The blade velocity is 375 m/s and the blade coefficient is 0.75. Assuming no loss due to shock at inlet, calculate for a mass flow of 0.5 kg/s and symmetrical blading; i) blade inlet angle, and driving force on the wheel. | 10M |

(OR)

| | | | |
|---|---|---|---|
| 8. | (a) | Explain the functions of the blading of a reaction turbine. | 4M |
| | (b) | Draw the combined velocity triangle for a single stage reaction turbine and derive an expression for work done per stage. | 10M |

## UNIT-V

| | | | |
|---|---|---|---|
| 9. | (a) | What are the functions the condenser in a steam plant? | 4M |
| | (b) | Explain the principles of operation of different types of jet condensers. | 10M |

(OR)

| | | | |
|---|---|---|---|
| 10. | (a) | What is the requirement of steam condensing plant? | 4M |
| | (b) | In a surface condenser the vacuum maintained is 700 mm of Hg. The barometer reads 754 mm. If the temperature of condenser is $18^0$C determine: 1. Mass of air per kg of steam and 2. Vacuum efficiency. | 10M |

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

## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: ANTENNA AND WAVE PROPAGATION (ECE)*

Time : 3 Hours                                                                              Max. Marks: 70

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

### UNIT - I

1.  (a)  Explain the antenna parameters                                                                10M
         i) Radiation pattern ii) Beam area iii) Directivity iv) FBR  v) Radiation Intensity

    (b)  The radiation resistance of an antenna is 72 $\Omega$ and the loss resistance is 8 $\Omega$. What is     4M
         its directivity if the power gain is 16?

(OR)

2.  Explain i) Antenna Temperature ii) Front to Back Ratio (iii) Retarded potential          14M
    iv) Fields from oscillating dipole v) Antenna Field zones

### UNIT – II

3.  Explain in detail about Arrays of 2 Isotropic Sources?                                             14M

(OR)

4.  (a)  Write about Multiplication of pattern?                                                        2M

    (b)  Draw the radiation pattern of 8 isotropic elements fed in phase, spaced $\lambda/2$ apart     12M
         With the principle of pattern Multiplication?

### UNIT – III

5.  Write brief notes on i) parabolic reflector antenna ii) Microstrip Antenna                         14M

(OR)

6.  (a)  Explain in detail about a folded dipole antenna?                                              8M

    (b)  Explain measurement of gain by direct comparison method?                                     6M

### UNIT – IV

7.  Write short notes on i) Fading and Path losses ii) Wave tilt  iii) Super refraction               14M

(OR)

8.  (a)  Explain about tropospheric propagation.                                                       7M

    (b)  Explain the effect of earth's curvature on wave propagation.                                  7M

### UNIT-V

9.  Write short notes on i) Critical frequency, ii) MUF,  iii) LUF, iv) OF, v) Virtual                14M
    height, vi) Skip Distance

(OR)

10.  Discuss briefly about sky wave propagation and explain the terms                                  14M
     (i) Maximum usable frequency (ii) virtual height (iii) Multi-Hop propagation

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: DIGITAL COMMUNICATIONS (ECE)*

Time: 3 Hours　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

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

### UNIT – I

| | | | |
|---|---|---|---|
| 1. | (a) | With neat block diagram, Explain the process of Sampling and Quantization in digital communication. | 7M |
| | (b) | Explain about the noise in PCM systems. | 7M |

(OR)

| | | | |
|---|---|---|---|
| 2. | (a) | Explain the comparison between TDM and FDM | 7M |
| | (b) | Explain the working principle of Delta Modulation system | 7M |

### UNIT – II

| | | | |
|---|---|---|---|
| 3. | (a) | Write short notes on cross talk and eye diagram | 7M |
| | (b) | Explain Nyquist criterion | 7M |

(OR)

| | | | |
|---|---|---|---|
| 4. | (a) | Explain modified duobinary signal scheme with the help of diagram | 7M |
| | (b) | Represent the binary sequence 100111010 using the following formats | 7M |
| | | ii) Bipolar　　　　ii) Split Manchester code | |

### UNIT – III

| | | | |
|---|---|---|---|
| 5. | (a) | Draw the block diagram of digital communication system and explain each block in detail | 7M |
| | (b) | Define the following: | 7M |
| | | i) Shannon's Source Coding Theorem ii) Channel Capacity | |

(OR)

| | | | |
|---|---|---|---|
| 6. | (a) | Mention the advantages of digital communication over analog communication. | 7M |
| | (b) | Explain the concept of entropy and its properties. | 7M |

### UNIT – IV

| | | | |
|---|---|---|---|
| 7. | (a) | Write short notes on Hamming codes. | 7M |
| | (b) | What are code tree, code trellis and state diagrams for convolution encoders? | 7M |

(OR)

| | | | |
|---|---|---|---|
| 8. | (a) | Explain about Error detection and Correction capabilities of Hamming codes | 7M |
| | (b) | Derive the steps involved in generation of linear block codes | 7M |

### UNIT-V

| | | | |
|---|---|---|---|
| 9. | (a) | With neat diagrams and equations, explain about PSK system. | 7M |
| | (b) | Give a comparison between FSK and PSK schemes. | 7M |

(OR)

| | | | |
|---|---|---|---|
| 10. | (a) | Explain about DPSK system. And also give the comparison between DPSK and PSK | 7M |
| | (b) | Explain coherent ASK and non coherent ASK schemes | 7M |

## K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
### B.Tech. V Sem.(R15) Regular & Supple. Examinations of October/November 2019
### *SUB: LINEAR IC APPLICATIONS ( ECE )*

Time : 3 Hours                                                                 Max. Marks: 70

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

### UNIT – I

| | | | |
|---|---|---|---|
| 1. | (a) | Write the properties of Different Configurations of Differential Amplifier. | 7M |
| | (b) | Explain the Block diagram of Operational amplifier with neat sketch. | 7M |

(OR)

| | | | |
|---|---|---|---|
| 2. | (a) | Explain Input Bias Current compensation with a neat diagram. | 7M |
| | (b) | Explain the Frequency compensation using pole-zero method. | 7M |

### UNIT – II

| | | | |
|---|---|---|---|
| 3. | (a) | With a neat sketch explain the OP-AMP differentiator circuit. | 7M |
| | (b) | Explain the operation of V to I and I to V converter. | 7M |

(OR)

| | | | |
|---|---|---|---|
| 4. | (a) | Explain the operation of AC amplifier using OP-AMP. | 7M |
| | (b) | Explain the operation of Sample and Hold circuit. | 7M |

### UNIT – III

| | | | |
|---|---|---|---|
| 5. | (a) | Explain the operation of the Triangular wave generator using op-amp. | 7M |
| | (b) | Derive the transfer function for the first order HPF, and also plot its frequency response. | 7M |

(OR)

| | | | |
|---|---|---|---|
| 6. | (a) | Explain the operation of the Schmitt Trigger using OP-AMP. | 7M |
| | (b) | Derive the transfer function for the second order Active filter, and also plot its frequency response. | 7M |

### UNIT –IV

| | | | |
|---|---|---|---|
| 7. | (a) | Draw the Functional Block diagram of 555 Timer & Explain its operation. | 7M |
| | (b) | Explain the working of IC 565 PLL. | 7M |

(OR)

| | | | |
|---|---|---|---|
| 8. | (a) | Explain the working of Astable multivibrator using 555Timer. | 7M |
| | (b) | Explain the working of Monostable multivibrator using 555Timer. | 7M |

### UNIT – V

| | | | |
|---|---|---|---|
| 9. | (a) | Explain the working of Inverted R-2R Ladder DAC. | 7M |
| | (b) | Explain the working of a Dual slope ADC converter. | 7M |

(OR)

| | | | |
|---|---|---|---|
| 10. | (a) | Explain the working of Counter type ADC. | 7M |
| | (b) | Explain the working of Successive Approximation ADC. | 7M |

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### SUB: MICROPROCESSORS AND INTERFACING ( ECE )

Time : 3 Hours          Max. Marks: 70

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

### UNIT - I

1. (a) Describe Various Signals of Timing and Control Unit of 8085 Microprocessor?    8M
   (b) Write an 8085 Assembly Language Program to Multiply two 8 bit numbers and store 16 bit answer.    6M

(OR)

2. (a) Describe about interrupt control unit of 8085 Microprocessor?    8M
   (b) Identify addressing modes of the following Instructions    6M
   i) MOV A,M      ii) ADD B      iii) ADI 08H
   iv) IN 55H      v) XTHL      vi) LXI B,1122H

### UNIT – II

3. (a) Explain BIU &EU of 8086?    8M
   (b) How many String Instructions are there in 8086 explain?    6M

(OR)

4. (a) Explain Maximum mode Configuration along with pin Description?    8M
   (b) What are the Uses of Segment Registers?    6M

### UNIT – III

5. (a) Write an 8086 ALP to add Even Numbers stored in an array    8M
   (b) Write an ALP to find 7-Segment Code using a Lookup Table?    6M

(OR)

6. (a) Write an ALP to add two 64 bit Numbers?    8M
   (b) Write an ALP to find the Factorial of Number?    6M

### UNIT – IV

7. (a) Draw the 8255 interfacing diagram with 8086 with address 00,01,02,03. ?    8M
   (b) Explain the CWR of 8255?    6M

(OR)

8. (a) Draw the Block diagram of 8254     and explain different modes of operation?    8M
   (b) What is the difference between DMA & Interrupt data Transfer. ?    6M

### UNIT-V

9. (a) Write an ALP to Rotate Stepper motor by 180 degrees in clockwise direction?    8M
   (b) Write an ALP to generate Triangular waveform from a DAC?    6M

(OR)

10. (a) Design a Traffic Light Contro, System Using 8086&8255?    8M
    (b) Draw Flow Chart/ALP to Control Traffic lights. ?    6M

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: Industrial Management ( ME )*

Time : 3 Hours                                              Max. Marks: 70

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

### UNIT - I

1. (a) Identify an appropriate layout for each of the following situations. Justify your choice in a    10M
   sentence or two:
   i) A manufacturer of garments for Van Heusen
   ii) A multi cuisine restaurant in a posh residential area in Mumbai.
   iii) The overhaul of helicopters.
   iv) A fabricator of custom made PCBs for a large number of electronic applications.
   v) An eye hospital.
   vi) A motor manufacturer manufacturing 4 product groups for worldwide markets.
   vii) A manufacturer of large turbines for power sector applications.

   (b) Define material handling? Explain principles of material handling?    4M

(OR)

2. (a) Define plat layout and explain about product layout with advantages and limitations and    7M
   applications.

   (b) Explain about bucket conveyors with neat sketches.    7M

### UNIT – II

3. (a) Define the work study. State its objectives and benefits.    7M

   (b) In what respect have Fayol's principles of management resulted in contributions to    7M
   management methods that are different from the techniques of Taylor's scientific
   management?

(OR)

4. (a) What are the important factors effecting work study    7M

   (b) Explain in detail on various principles of motion economy.    7M

### UNIT – III

5. (a) What do you understand by work sampling? Explain the process for conducting duble    7M
   sampling.

   (b) A time study was made of a punch press operator. The average observed time after    7M
   discounting non normal occurrences was 0.52 minute per unit. The operator performance was
   judged to be 90 and the allowances for this type of work total 12 percent. What is the normal
   time and standard time for this job?

(OR)

6. (a) Assume that the total observed time for an operation of assembling an electric switch is 1    7M
   min, if the rating is 120%find normal time. If any allowances of 10% is allowed for the
   operation, determine the standard time.

   (b) State the advantages and limitations of stopwatch time over work sampling.    7M

### UNIT – IV

7. (a) Briefly explain about CPM and PERT    7M

   (b) What is Float? Discuss in brief different types of floats?    7M

(OR)

8.    A project management firm is preparing a network for one of the projects that it has recently    14M
   bid for. The client demands that the project needs to be completed and delivered at its site by
   week 25. The firm has identified the list of activities to be performed and estimated the
   duration of each of the activities. The details are given in the table below. Use this information
   to draw a network and help the firm answer the following questions

   i) Will the firm be able to meet with the customer's dead line of 25 weeks?

ii) If the firm cannot, identify the set of activities that need to be considered for a possible reduction in duration.
iii) If the cost of reduction is RS 10000 per week and the firm will have to pay a penalty of Rs 7000 per week of delay in completion in addition to paying affixed amount of Rs 20000, what will your recommendation be to the firm with respect to reducing the duration?

| ACTIVITY | IMMEDIATE PREDECESSORS | DURATION (WEEKS) |
|---|---|---|
| A | - | 8 |
| B | A | 3 |
| C | A | 6 |
| D | A | 4 |
| E | B | 5 |
| F | B | 4 |
| G | C,E | 6 |
| H | D | 6 |
| I | F | 6 |
| J | D | 4 |
| K | G,H,I | 3 |
| L | J,K | 3 |

**UNIT-V**

9. (a) The following represents a project that should be scheduled using PERT      7M
   iv)  Draw the network
   v)   Identify its critical path and expected project completion time.
   vi)  What is probability of completing this project within 35 days?

| ACTIVITY | IMMEDIATE PREDECESSORS | TIME (DAYS) | | |
|---|---|---|---|---|
| | | OPTIMISTIC TIME | MOST LIKELY TIME | PESSIMISTIC TIME |
| A | - | 10 | 22 | 28 |
| B | A | 4 | 4 | 10 |
| C | A | 4 | 6 | 14 |
| D | B | 1 | 2 | 3 |
| E | C | 1 | 5 | 9 |
| F | C,D | 7 | 8 | 9 |
| G | E,F | 2 | 2 | 2 |

(b) A manufacturer of garments wants to set up a quality control system using control charts for      7M
process control. The manufacturer has the three options to choose from:
i) Measure the critical dimensions of the garment for establishing its quality.
ii) Segregate every batch of production into good quality and seconds quality.
iii) Estimate the number of defects for bale of cloth issued for production
The manufacturer is not sure about what it means to choose which of the above. Prepare a report explaining the pros and cons of each of the choices, the nature of efforts required to setup control charts a nd implications of their use.

(OR)

10. (a) The following table gives the number of defects in a casting used for making crank case of a      10M
diesel engine.

| Casting no | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Number of defects | 15 | 11 | 25 | 10 | 12 | 20 | 15 | 10 | 17 | 13 |

Construct a C-Chart with 3 sigma limits and comment on the casting process.

(b) Explain the procedure for construction of control charts for variables.      4M

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: Thermal Engineering - II ( ME )*

Time: 3 Hours　　　　　　　　　　　　　　　　　　　Max. Marks: 70

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

### UNIT - I

1.  (a) Explain Rankine cycle with *P-V* and *T-S* diagrams.　　　　　　　　　　4M
    (b) A steam power plant is supplied with dry saturated steam at a pressure of 12 bar and 10M
        exhausts into a condenser at 0.1 bar. Calculate the Rankine efficiency by using 1. Steam
        tables and 2. Mollier chart.

(OR)

2.  (a) Explain the concept of mean temperature of heat addition.　　　　　　　4M
    (b) Explain with the help of *P-V* and *T-S* diagrams, the sequence of operations in the modified 10M
        Rankine cycle.

### UNIT – II

3.  (a)  What is a steam boiler? How they are classified?　　　　　　　　　　4M
    (b) The following observations were made in a boiler trail: Coal used 250 kg of calorific value 10M
        29800 kJ/ kg, water evaporated 2000 kg, steam pressure 11.5 bar, dryness fraction of steam
        0.95 and feed water temperature $34^0$C. calculate the equivalent evaporation from and $100^0$
        C per kg of coal and the efficiency of the boiler.

(OR)

4.  (a) Explain briefly the term boiler efficiency.　　　　　　　　　　　　　4M
    (b) Explain the various losses in a boiler and draw the heat balance sheet of a boiler.　10M

### UNIT – III

5.  (a) Explain the function of nozzles used with steam turbines.　　　　　　　4M
    (b) Dry saturated steam at a pressure of 15 bar enters in a nozzle and is discharged at a pressure 10M
        of 1.5 bar. Find the final velocity of the steam, when the initial velocity of is negligible.

(OR)

6.  (a) Explain various types of steam nozzles.　　　　　　　　　　　　　　4M
    (b) Dry saturated steam at 10 bar is expanded isentropically in a nozzle to 0.1 bar. Using steam 10M
        tables find the dryness fraction of the steam at exit. Also find the velocity of steam leaving
        the nozzle when 1.initial velocity negligible and 2.initial velocity of the steam is 135 m/s.

### UNIT – IV

7.  (a) What is a turbine? How does it differ from a steam engine?　　　　　　4M
    (b) The velocity of steam, leaving the nozzles of an impulse turbine is 1200 m/s and the nozzle 10M
        angle is $20^0$. The blade velocity is 375 m/s and the blade coefficient is 0.75. Assuming no
        loss due to shock at inlet, calculate for a mass flow of 0.5 kg/s and symmetrical blading; i)
        blade inlet angle, and driving force on the wheel.

(OR)

8.  (a) Explain the functions of the blading of a reaction turbine.　　　　　　4M
    (b) Draw the combined velocity triangle for a single stage reaction turbine and derive an 10M
        expression for work done per stage.

### UNIT-V

9.  (a) What are the functions the condenser in a steam plant?　　　　　　　4M
    (b) Explain the principles of operation of different types of jet condensers.　　10M

(OR)

10. (a) What is the requirement of steam condensing plant?　　　　　　　　4M
    (b) In a surface condenser the vacuum maintained is 700 mm of Hg. The barometer reads 754 10M
        mm. If the temperature of condenser is $18^0$C determine: 1. Mass of air per kg of steam and
        2. Vacuum efficiency.

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
**B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019**
*SUB: Dynamics of Machinery - I ( ME )*

Time : 3 Hours                                                    Max. Marks: 70

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

## UNIT - I

1.  (a) What is a gear train and what are its main types?     6M
    (b) Two shafts A and B are co-axial. A gear C (50 teeth) is rigidly mounted on shaft   8M
        A. A compound gear D-E gears with C and an internal gear G. D has 20 teeth and
        gears with C and E has 35 teeth and gears with an internal gear G. The gear G is
        fixed and is concentric with the shaft axis. The compound gear D-E is mounted on
        a pin which projects from an arm keyed to the shaft B. Sketch the arrangement and
        find the number of teeth on internal gear G assuming that all gears have the same
        module. If the shaft A rotates at 110 r.p.m., find the speed of shaft B.

(OR)

2.  (a) What is a reverted gear train? Where is it used?     4M
    (b) An Epicyclic gear train shown in figure-1 is composed of a fixed annular wheel A   10M
        having 150 teeth. The wheel A is in mesh with gear B which drives the gear D
        through an idler gear C. Gear D is in concentric with annular wheel A. Gears B and
        C are carried on an arm which revolves clockwise at 100 rpm about the axis A and
        D. If the gears B and D have 25 and 4o teeth respectively, find the number of teeth
        on gear C and speed and direction of its rotation.
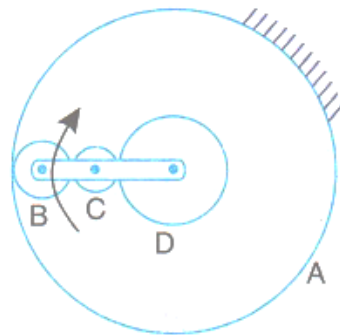


Figure - 1

## UNIT – II

3.  (a) Derive an expression for the length of the belt in a cross belt drive.     7M
    (b) Sketch and explain the working of a single plate clutch.     7M

(OR)

4.  (a) Derive an expression for the ratio of tight side and slack side tensions in case of   7M
        flat belt drive.
    (b) Sketch and explain the working of a Centrifugal clutch.     7M

## UNIT – III

5.  (a) What is a brake and Classify different types of brakes.     4M
    (b) A differential band brake, as shown in Figure-2 has an angle of contact of 225°.   10M
        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 : (i). The necessary force (P)
        for the clockwise and anticlockwise rotation of the drum; and (ii). The value of
        'OA' for the brake to be self locking, when the drum rotates clockwise.
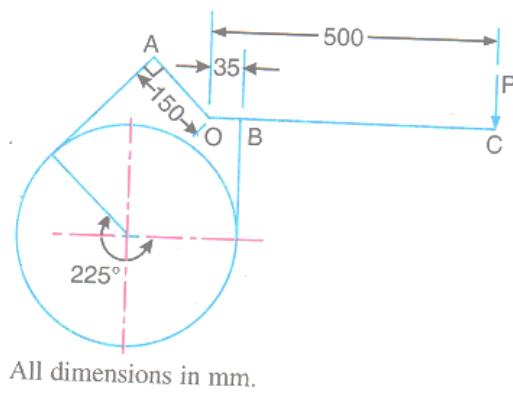
All dimensions in mm.

**Figure - 2**

(OR)

6.  (a)  Sketch and explain the working principle of internal expanding shoe brake.          7M
    (b)  With a neat sketch explain the working principle of Rope brake dynamometer.          7M

## UNIT – IV

7.  The turning moment diagram for a multi-cylinder engine has been drawn to a scale     14M
    of 1 mm to 500 N-m torque and 1 mm to 6° of crank displacement. The intercepted
    areas between output torque curve and mean resistance line taken in order from
    one end, in sq. mm are – 30, + 410, – 280, + 320, – 330, + 250, – 360, + 280, – 260
    sq. mm, when the engine is running at 800 r.p.m. The engine has a stroke of 300
    mm and the fluctuation of speed is not to exceed ± 2% of the mean speed.
    Determine a suitable diameter and cross-section of the flywheel rim for a limiting
    value of the safe centrifugal stress of 7 MPa. The material density may be assumed
    as 7200 kg/m3. The width of the rim is to be 5 times the thickness.

(OR)

8.  The turning moment curve for an engine is represented by the equation, T = (20     14M
    000 + 9500 sin 2θ – 5700 cos 2θ) N-m, where  θ is the angle moved by the crank
    from inner dead centre. If the resisting torque is constant, find: 1. Power developed
    by the engine ; 2. Moment of inertia of flywheel in kg-m2, if the total fluctuation
    of speed is not  exceed 1% of mean speed which is 180 r.p.m; and 3. Angular
    acceleration of the flywheel when the crank has turned through 45° from inner dead
    centre.

## UNIT-V

9.  (a)  Classify different types of centrifugal governors.          4M
    (b)  The upper arms of a Porter governor has lengths 350 mm and are pivoted on the     10M
    axis of rotation. The lower arms has lengths 300 mm and are attached to the sleeve
    at a distance of 40 mm from the axis. Each ball has a mass of 4 kg and mass on the
    sleeve is 45 kg. Determine the equilibrium speed for a radius of rotation of 200 mm
    and find also the effort and power of the governor for 1 per cent speed change.

(OR)

10. (a)  Define  the following terms relating to governors :          6M
    i). Stability, ii). Isochronism, iii). Power and vi). Effort.
    (b)  A Proell governor has all four arms of length 305 mm. The upper arms are pivoted     8M
    on the axis of rotation and the lower arms are attached to a sleeve at a distance of
    38 mm from the axis. The mass of each ball is 4.8 kg and are attached to the
    extension of the lower arms which are 102 mm long. The mass on the sleeve is 45
    kg. The minimum and maximum radii of governor are 165 mm and 216 mm.
    Assuming that the extensions of the lower arms are parallel to the governor axis at
    the minimum radius, find the corresponding equilibrium speeds

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: Machine Tools ( ME )*

Time : 3 Hours                                                                 Max. Marks: 70

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

### UNIT - I

1. (a) Identify any three work holding devices that are used on a lathe with a neat sketch?          6M
   (b) Define Taper. Explain any one taper turning methods with a neat sketch          8M

(OR)

2. (a) Is lathe machine or machine tool? How do you specify lathe?          6M
   (b) Explain thread cutting operation with neat sketch          8M

### UNIT – II

3. (a) Explain the various parts of a shaper with a neat sketch          8M
   (b) what are the specifications of a shaper and plane          6M

(OR)

4. (a) Explain various parts of a double housing planer          8M
   (b) With the help of a neat sketch explain the parts of a slotter          6M

### UNIT – III

5. (a) Explain the any three operations performed in drilling machine with neat sketch?          6M
   (b) Explain about upright drilling machine, with sketch?          8M

(OR)

6. (a) Classify the boring machines and explain it with suitable applications          6M
   (b) Explain any two tool holding devices that are used in a drilling machine with neat sketch          8M

### UNIT – IV

7. (a) Explain plain indexing method with neat sketch          6M
   (b) Distinguish between up milling and down milling with diagram          8M

(OR)

8. (a) Draw a neat sketch of horizontal milling machine and lable the parts          8M
   (b) Explain the slab milling operation with neat sketch          6M

### UNIT-V

9. (a) Explain the various parts of tool and cutter grinder with a neat sketch          10M
   (b) What is meant by grit, grade of grinding wheel          4M

(OR)

10. (a) Write short note on wheel truing and dressing          4M
    (b) Explain the working principle of external centre less grinder and the types of feeds with neat sketch          10M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**
**B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019**
**SUB:** *Design of Machine Elements - I ( ME )*

Time : 3 Hours                                                                                    Max. Marks: 70

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

## UNIT – I

1. (a) Explain the general considerations in machine design.                                     4M

   (b) A bracket, as shown in Fig. Q1(b), is bolted to the framework of a machine which carries a    10M
   load P. The cross-section at 40 mm from the fixed end is rectangular with dimensions, 60 mm
   × 30 mm. If the maximum stress is limited to 70 MPa, find the value of P.
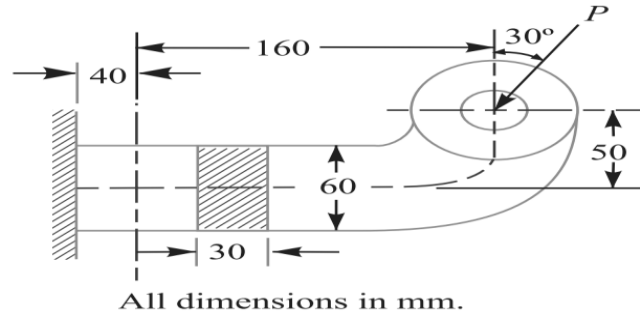


**Fig.** Q1(b)

**(OR)**

2. (a) Explain Indian standard designations for various Cast Irons and steels in detail.           4M

   (b) A shaft, as shown in Fig. Q2(b), is subjected to a bending load of 3 kN, pure torque of 1000 N-    10M
   m and an axial pulling force of 15 kN. Calculate the stresses at A and B.



**Fig.** Q2(b)

## UNIT – II

3. (a) State and write the equations for different theories failures in design.                    7M

   (b) A 25 KN tensile load acts on the following members. Considering stress concentration.        7M
   Calculate      the       maximum       stress     induced      in      each      member.
   i) A stepped shaft of diameter 60 mm & 30 mm with fillet radius 5mm
   ii) A rectangular plate 60 mm wide and 10 mm thick with a transverse hole of 12 mm diameter.

**(OR)**

4. (a) Define factor of safety and list four factors to be considered in selection of factor of safety.   4M

   (b) A hot rolled steel shaft is subjected to a torsional moment that varies from 330 N-m clockwise    10M
   to 110 N-m counterclockwise and an applied bending moment at a critical section varies from
   440 N-m to – 220 N-m. The shaft is of uniform cross-section and no keyway is present at the
   critical section. Determine the required shaft diameter. The material has an ultimate strength of
   550 MN/m$^2$ and yield strength of 410 MN/m$^2$. Take the endurance limit as half the ultimate
   strength, factor of safety of 2, size factor of 0.85 and a surface finish factor of 0.62.

5.  (a)  A welded connection, as shown in Fig. Q5(a) is subjected to an eccentric force of 60 KN in the plane of welds. Determine the size of the welds, if the permissible shear stress for the weld is 100 N/mm². Assume static conditions.  **8M**
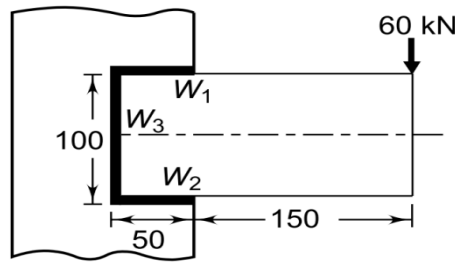


**Fig.** Q5(a)

    (b)  Explain the method of determining the size of the bolt when the bracket carries an eccentric load perpendicular to the axis of the bolt.  **6M**

**(OR)**

6.  A bracket is bolted to a column by 6 bolts of equal size as shown in Fig. Q6. It carries a load of 60kN at a distance of 200 mm from the centre of column. If the maximum stress in the bolts is to be limited to 180 MPa, determine the diameter of bolt.  **14M**
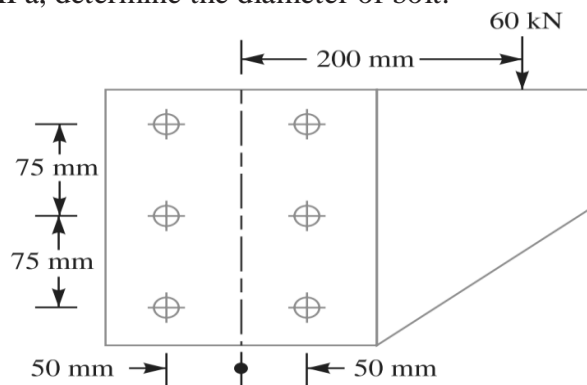


**Fig.** Q 6

UNIT – IV

7.  A solid steel shaft is supported on two bearings 1.8 m apart and rotates at 250 r.p.m. A 20° involute gear D, 300 mm diameter is keyed to the shaft at a distance of 150 mm to the left on the right hand bearing. Two pulleys B and C are located on the shaft at distances of 600 mm and 1350 mm respectively to the right of the left hand bearing. The diameters of the pulleys B and C are 750 mm and 600 mm respectively. 30 kW is supplied to the gear, out of which 18.75 kW is taken off at the pulley C and 11.25 kW from pulley B. The drive from B is vertically downward while from C the drive is downward at an angle of 60° to the horizontal. In both cases the belt tension ratio is 2 and the angle of lap is 180°. The combined fatigue and shock factors for torsion and bending may be taken as 1.5 and 2 respectively.  **14M**
Design a suitable shaft taking working stress to be 42 MPa in shear and 84 MPa in tension.

**(OR)**

8.  (a)  Explain the concept of ASME code in the design of shafts  **4M**

    (b)  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.  **10M**

**UNIT-V**

9. (a) Two rods, made of plain carbon steel ($\sigma_y = 380$ MPa), are to be connected by means of a cotter joint. The diameter of each rod is 50 mm and the cotter is made from a steel plate of 15 mm thickness. Calculate the dimensions of the socket end making the following assumptions:  10M
   (i) the yield strength in compression is twice of the tensile yield strength; and
   (ii) the yield strength in shear is 50% of the tensile yield strength.
   The factor of safety is 6.

   (b) How are the keys classified? Draw neat sketches of different types of keys and state their applications.  4M

**(OR)**

10. (a) Distinguish between cotter joint and knuckle joint.  4M
   (b) A 20 kW, 1200 r.p.m. motor has a mild steel shaft of 45 mm diameter and the extension being 75 mm. The permissible shear and crushing stresses for the mild steel key are 56 MPa and 112 MPa. Design the keyway in the motor shaft extension. Check the shear strength of the key against the normal strength of the shaft.  10M

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: Heat Transfer ( ME )*

Time : 3 Hours                                                        Max. Marks: 70

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

## UNIT - I

1.  (a)  Derive general heat conduction equation in Cartesian co-ordinate system for homogeneous and isotropic.    7M

    (b)  A composite slab consists of 250 mm fire clay brick (k=1.09 W/mK) inside, 100 mm fired earth brick(0.26 W/mK) and outer layer of common brick (0.6 W/mK) of thickness 50 mm. If inside surface is at $1200^0$C and outside surface is at $100^0$C, find (a) heat flux,(b) the temperature of the junctions.    7M

(OR)

2.  (a)  Derive an expression for critical thickness of insulation for cylinder.    7M

    (b)  A steel tube (K = 43.26 W/mK) of 5.08 cm inner diameter and 7.62 cm outer diameter is covered with 2.5 cm layer of insulation (K = 0.208 W/mK) the inside surface of the tube receivers heat from a hot gas at the temperature of $316^0$C with heat transfer co-efficient of 28 $W/m^2$K. While the outer surface exposed to the ambient air at $30^0$C with heat transfer co-efficient of 17 $W/m^2$K. Calculate heat loss for 3 m length of the tube.    7M

## UNIT – II

3.  (a)  Derive equation for lumped heat capacity analysis?    7M

    (b)  Aluminum sphere weighing 5.5kg and initially at a temperature of $290^0$C is suddenly immersed in a fluid at $15^0$C. The convective heat transfer coefficient in 59 $W/m^2$k. Estimate the time required to cool the aluminum to $95^0$C.    7M

(OR)

4.  (a)  Define heat efficiency and effectiveness of the fin    7M

    (b)  An Aluminium alloy fin of 7 mm thick and 50 mm long protrudes from a wall, which is maintained at 120 $^0$C. The ambient air temperature is 22 $^0$C. The heat transfer coefficient and conductivity of the fin material are 140 $W/m^2$K and 55W/mK respectively. Determine i) Temperature at the end of the fin ii) Temperature at the middle of the fin. iii) Total heat dissipated by the fin    7M

## UNIT – III

5.  (a)  Explain the following laws relevant to radiation heat transfer    7M

    (i) Kirchhoff's law.                    (ii) Wien's displacement law.

    (iii) Planck's law.                     (iv) Stefan Boltzmann law.

    (b)  Emissivity of two large parallel at 800˚C and 300˚C are 0.3 and 0.5 respectively. Find the net energy transfer rate per square meter.    7M

(OR)

6.  (a)  Explain the concept of black body with neat diagram.    7M

    (b)  What is meant by absorptivity, reflectivity and transmissivity?    7M

## UNIT – IV

7. (a) Define Reynolds, Nusselt, and Prandtl numbers. Explain their importance in convective heat transfer.  7M

   (b) Heat transfer rates by free convection over a 0.3 m high vertical plate maintained at a uniform temperature $T_w$=80 $^0$C to an ambient $T_\infty$=24 $^0$C containing air at 1.0 atm.  7M

(OR)

8. (a) Distinguish between Bulk mean temperature and Film temperature  7M

   (b) Air stream of 30°C moves with a velocity of 0.3 m/s across a 100 W electric bulb at 130° C. If the bulb is approximated by a 0.06 m diameter sphere, estimate the rate and the percentage lost due to convection alone.  7M

## UNIT-V

9. (a) Draw and explain the temperature variation in parallel flow and counter flow heat exchangers.  7M

   (b) In a counter flow double pipe heat exchanger water is heated from 40$^0$C to 80$^0$C with oil entering at 105$^0$C and leaving at 70$^0$C.Taking the overall heat transfer coefficient as 300 W/m$^2$k and the water flow rate as 0.1Kg/s.  Calculate the heat exchanger area.  7M

(OR)

10. (a) Explain briefly the various regimes of pool boiling.  7M

    (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.  7M

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
## B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### SUB: MICROPROCESSORS & 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) | With neat diagram explain the architecture of 8086 micro processor. | 7 M |
| | (b) | What are the various data related addressing modes used in 8086 microprocessor? | 7 M |

(OR)

| | | |
|---|---|---|
| 2. | With neat diagram explain the 40 pins of 8086 microprocessor? | 14M |

### UNIT – II

| | | | |
|---|---|---|---|
| 3. | (a) | Explain the assembler directives? | 7 M |
| | (b) | Write an ALP to find out a smallest number from an array? | 7 M |

(OR)

| | | | |
|---|---|---|---|
| 4. | (a) | Write an ALP to find average value from the given array of a data? | 7 M |
| | (b) | Write an ALP to find out the data is a palindrome or not? | 7 M |

### UNIT – III

| | | | |
|---|---|---|---|
| 5. | (a) | With a block diagram explain the roll of DMA controller to transfer a data from I/O devices to memory or vice versa? | 7 M |
| | (b) | Explain about IEEE – 488? | 7 M |

(OR)

| | | |
|---|---|---|
| 6. | Explain Programmable Communication Interface(8251 USART) | 14M |

### UNIT – IV

| | | |
|---|---|---|
| 7. | How do you interface a 4 phase stepper motor to 8086 microprocessor? Draw the circuit and explain? | 14M |

(OR)

| | | | |
|---|---|---|---|
| 8. | (a) | Interface ADC to microprocessor. Draw the diagram clearly showing connections? | 7 M |
| | (b) | Explain the command words of 8255 | 7 M |

### UNIT-V

| | | | |
|---|---|---|---|
| 9. | (a) | List the general purpose registers in 80486. | 7 M |
| | (b) | Explain the memory management of 80486. | 7 M |

(OR)

| | | |
|---|---|---|
| 10. | Explain in detail the Pentium pro– microprocessor. | 14M |

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
**B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019**
*SUB: ADVANCED COMPUTER ARCHITECTURE (CSE)*

Time : 3 Hours                                                    Max. Marks: 70

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

### UNIT - I

1. (a) Explain in detail about Evolution of computer Architecture?          7M
   (b) Explain about below parallelisms?                                    7M
      i)Implicit            ii)Explicit

(OR)

2. (a) Explain about Data dependencies in parallelism concept?              7M
   (b) Explain about four static connection networks with neat diagrams?    7M

### UNIT – II

3. Explain Amdahl's law in detail?                                          14M

(OR)

4. Explain about Mean performance with formulas?                            14M

### UNIT – III

5. Explain about Backplane BUS specification with neat diagram?             14M

(OR)

6. Explain about Reservations and Latency analysis for Non linear pipeline processors?          14M

### UNIT – IV

7. Explain about Crossbar Switch design with neat diagram?                  14M

(OR)

8. Explain about Multiport memory with neat diagram?                        14M

### UNIT-V

9. Explain about Scalable Coherence Interface with neat diagram?            14M

(OR)

10. Explain about Multithreading issues?                                    14M

## K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
### B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: COMPILER DESIGN (CSE)*

Time : 3 Hours                                                                                  Max. Marks: 70

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

### UNIT - I

1.  (a)  Explain about Language processing system to analyze the source program        6M
    (b)  Explain about different phases of a compiler                                   8M

(OR)

2.  (a)  Find out the patterns for the tokens of the below grammar.                     10M

    Stmt $\rightarrow$ **if** expr **then** stmt | **if** expr **then** stmt **else** stmt | ε

    expr $\rightarrow$ term **relop** term | term

    term $\rightarrow$ **id** | **number**

    (b)  Define Prefix, suffix, substring and subsequence                               4M

### UNIT – II

3.  (a)  Define a context-free grammar. Write the grammar for simple arithmetic          7M
         expressions.
    (b)  Draw the sequence of parse trees for the below derivation of –(id+id) using     7M
         simple arithmetic expression grammar.

(OR)

4.  (a)  Construct the Predictive parse table for the below grammar after eliminating the  7M
         left recursion

    E $\rightarrow$ E + T | T

    T $\rightarrow$ T * F | F

    F $\rightarrow$ (E) | id

    (b)  Explain about shift reduce parsing                                              7M

### UNIT – III

5.  (a)  Define Synthesized attribute and inherited attribute. Write the syntax-directed  7M
         definition of a simple desk calculator.
    (b)  Draw the annotated parse tree for 3*5+4                                         7M

(OR)

6.  (a)  Explain about Type expressions.                                                7M
    (b)  Explain about S-Attributed definition and L- Attributed definitions.           7M

### UNIT – IV

7.  (a)  Define Activation record. Explain the various fields in the activation record.  7M
    (b)  Construct a DAG and three-address code for the following instruction           7M

    a+ a*(b-c) +(b-c)*d

(OR)

8.  (a)  Define postfix notation and Three address code. Give examples                  6M
    (b)  Write the common three address instruction forms.                              8M

9.  (a) Explain about different issues in the design of a code generator    7M

    (b) Explain about Register allocation and assignment    7M

(OR)

10. Define basic block and Flow graph.    14M
    Construct the flow graph after code motion and after eliminating induction
    variable for the below program segment.

    ```
    begin
       PROD := 0;
       I := 1;
       do
          begin
             PROD := PROD + A[I] * B[I];
                   I := I + 1;
          end
        while I <=20
    end
    ```

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
**B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019**
*SUB: SOFTWARE ENGINEERING (CSE)*

Time : 3 Hours                                Max. Marks: 70

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

### UNIT - I

| | | | |
|---|---|---|---|
| 1. | (a) | Classify Perspective Process Models? Explain any one in detail with a neat sketch? | 7M |
| | (b) | Explain in detail Software Myths? | 7M |

(OR)

| | | | |
|---|---|---|---|
| 2. | (a) | Discuss in detail Personal and Team Process Model? | 7M |
| | (b) | Explain in detail Nature of Software? | 7M |

### UNIT – II

| | | | |
|---|---|---|---|
| 3. | (a) | Discuss in detail Scenario-Based Modeling? | 7M |
| | (b) | Explain how to Elicit Requirements? | 7M |

(OR)

| | | | |
|---|---|---|---|
| 4. | (a) | Briefly discuss about Class-Based Modeling? | 7M |
| | (b) | What do you mean by Negotiating Requirements? Explain different Negotiating Activities? | 7M |

### UNIT – III

| | | | |
|---|---|---|---|
| 5. | | Discuss in detail important Software Design concepts that span both Traditional and object-Oriented Software development? | 14M |

(OR)

| | | | |
|---|---|---|---|
| 6. | (a) | What is an Architectural Style? Explain in detail different Architectural Patterns? | 7M |
| | (b) | Define Component? Discuss briefly how to design Class-Based Components? | 7M |

### UNIT – IV

| | | | |
|---|---|---|---|
| 7. | (a) | Explain in detail Golden rules for Software Design? | 7M |
| | (b) | Discuss in detail about Black-Box Testing? | 7M |

(OR)

| | | | |
|---|---|---|---|
| 8. | (a) | Explain in-detail about various Code Reviews? | 7M |
| | (b) | Discuss in detail the steps involved in Interface Design? With a neat sketch. | 7M |

### UNIT-V

| | | | |
|---|---|---|---|
| 9. | (a) | Discuss in detail Metrics for Project Size Estimation? | 7M |
| | (b) | What is meant by Software Reverse Engineering and explain it. | 7M |

(OR)

| | | | |
|---|---|---|---|
| 10. | (a) | Write about Risk Management? | 7M |
| | (b) | Discuss in brief Characteristics of Software Maintenance? | 7M |

# K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
### B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: COMPUTER NETWORKS (CSE)*

Time : 3 Hours　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

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

### UNIT - I

1. (a) What do you mean by computer networks? Classify computer networks and explain them in brief.　　7M
   (b) Differentiate services, mechanisms and interfaces with respect to OSI and TCP/IP protocol suits.　　7M

(OR)

2. (a) Why layered approach is used for the design of computer networks.　　7M
   (b) What is Internet? Discuss history of Internet and Internet today.　　7M

### UNIT – II

3. (a) Explain Sliding Window Protocols in detail.　　7M
   (b) Write about CSMA and CSMA/CD in detail.　　7M

(OR)

4. (a) What are the Data Link Layer design issues? Explain.　　7M
   (b) What is pure ALOHA and slotted ALOHA? Mention the advantages of slotted ALOHA.　　7M

### UNIT – III

5. (a) Write the concept of distance vector routing and illustrate with an example.　　7M
   (b) Give the general principles of various congestion control algorithms.　　7M

(OR)

6. (a) Discuss in brief about Broadcast Routing and Multicast Routing.　　7M
   (b) Give the IPV4 datagram format and brief description of each field.　　7M

### UNIT – IV

7. (a) What are the Services and application of TCP? Compare TCP and UDP Protocol.　　7M
   (b) Draw and explain each field in the TCP segment header.　　7M

(OR)

8. (a) Discuss various flow control mechanisms in transport layer.　　7M
   (b) With a diagram, explain the connection establishment and release phases of TCP. Discuss the issues associated with them.　　7M

### UNIT-V

9. (a) What is DNS? Explain in brief about Name Services.　　7M
   (b) Explain briefly about the Architecture of WWW.　　7M

(OR)

10. (a) Explain in detail about the Client and Server in World Wide Web.　　7M
    (b) Illustrate the role of POP3 in Electronic Mail Applications.　　7M

## K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
### B. Tech. V Sem. (R15) Regular & Supple. Examinations of October/November 2019
### *SUB: WEB TECHNOLOGIES (CSE)*

Time : 3 Hours                                                                              Max. Marks: 70

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

### UNIT – I

1.  Explain in detail about XAMPP and WAMP bundle server                                  14M

(OR)

2.  Explain in detail about how to handle HTTP Request and Response.                       14M

### UNIT – II

3.  Explain about TABLE and its tags? Explain about LISTS and its tags?                    14M

(OR)

4.  (a) Write a Java Script to demonstrate if – else statement.                            7M
    (b) Write a Java Script to print multiple lines in a dialogue box.                     7M

### UNIT – III

5.  (a) Define interface.                                                                  2M
    (b) Discuss in detail about using interface.                                           12M

(OR)

6.  (a) Write about foreach statement with an example                                      7M
    (b) Explain about break and goto statement with an example                             7M

### UNIT – IV

7.  (a) Write in detail about how to set up HTTP – based authentication with PHP Code.     7M
    (b) Write in detail about how to set up cookie authentication with PHP code.           7M

(OR)

8.  (a) Discuss about reading environment and configuration variables.                     7M
    (b) Discuss about setting environment and configuration variables.                     7M

### UNIT-V

9.  (a) Write about understanding common form issues.                                      7M
    (b) Discuss in brief about MVC architecture.                                           7M

(OR)

10. Explain in detail about preventing multiple submission of a form.                      14M