Sub Code: 1501701 **R 15**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA-516003

Department of Civil Engineering

B. Tech VII Sem- Regular Examinations , 2020 Model Question Paper

Sub: STRUCTURAL ANALYSIS-II

Time: 3 Hours **Max. Marks: 70**

Answer ALL Questions. All Question Carry Equal Marks

UNIT-I

1. Determine the static and kinematic indeterminacies of the two pin jointed trusses shown in figure1 (a& b).

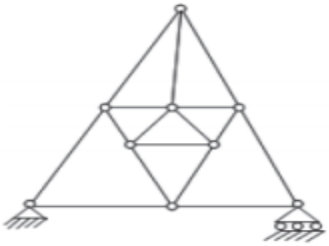

Fig.1(a)

Fig.1(b)

(Or)

2. A pin jointed framed structure is loaded as shown in figure 2 below. Calculate the forces in all members. Take area for horizontal members as 20 cm^2, vertical members as 30 cm^2, inclined members as 50 cm^2 and E = 2000 t/cm^2.

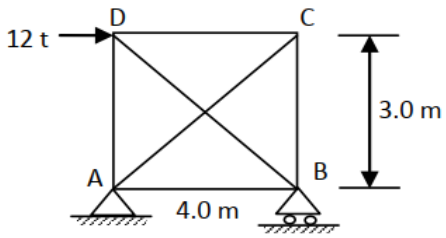

Fig.2

UNIT-II

3. A three-hinged parabolic arch of span 24 m and a central rise of 6 m is subjected to two concentrated loads 50 kN and 25 kN at a distance of 6 m and 10 m from right hinge and an uniformly distributed load of 240 kN/m on the left half of the span. Find the horizontal thrust, bending moment and the radial shear at a section 8 m from the left support. Also determine the maximum bending moment.

(Or)

4. A two hinged parabolic arch of span 25m, rise 6m is subjected to a udl of 15kN/m over the left half span and a point load of 25kN at 9.5m from the right support. Find the support reactions, BM, radial shear and normal thrust at 4m from the left support.

UNIT-III

5. Uniformly distributed load of intensity 32 kN/m crosses a simply supported span of 60m from left to right. The length of the udl is 15m. Find the value of maximum S.F maximum B.M at a section of 18 m from left end. Find also the absolute value of maximum B.M of the S.F in the section.

(Or)

6. A rolling load of 50 kN moves from left to right on simply supported beam of 26 m span. Find the values of maximum positive and negative shear force and bending moment at a section 16m from the left end support. Also find out the absolute maximum bending moment on the span due to this rolling load.

UNIT-IV

7. A uniformly distributed load of 55kN/m intensity and 5m long rolls across a beam of 15m long and simply supported at both ends. Draw influence lines for positives shear force, negative shear force and the bending moment at a section 7m from the left end. Using the influence lines, calculate the maximum positive and negative shear force and bending moment at a section 7m from the left end support. Also calculate the absolute maximum moment that can occur on the span and the position of the load for the absolute maximum bending moment.

(Or)

8. A rolling load of 95kN moves from left to right on simply supported beam of 27m span. Draw influence lines for positive shear force, negative shear force and the bending moment at a section 17m from the left end. Using the influence lines, find the values of

maximum positive and negative shear force and bending moment at a section 17m from the left end support.

UNIT-V

9. Analyse the beam shown in Fig.3, using flexibility method and draw S.F.D and B.M.D. Assume EI is constant.

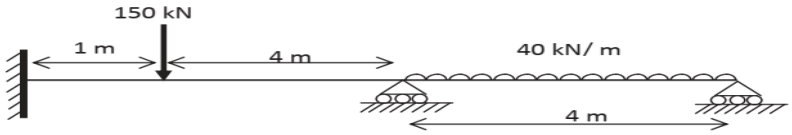

Fig.3

(Or)

10. Analyse the beam shown in Fig.4, using Stiffness method and draw S.F.D and B.M.D. Assume EI is constant.

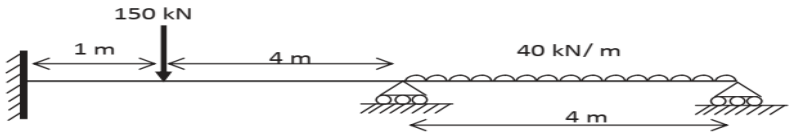

Fig.4

Sub Code: 1501702 **R 15**

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

B.Tech. VII Sem (R15) Model Paper

SUB: ***DESIGN AND DETAILING OF REINFORCED CONCRETE STRUCTURES-2***

***(*Civil Engineering)**

Time: 3 Hours **Max. Marks: 70**

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

Note: IS: 456-2000, IS-3370-2009 code book. SP-16 Design charts & Tables are permitted in the examination hall. Assume any suitable data if necessary. Draw the diagrams neatly.

	UNIT-I	
1	A hall measures 10m x 6m from inside, and has walls 400mm thick. Design a suitable R.C. T-beam roof to carry a super imposed load of 2000N/m^2.Use M20 concrete and Fe415 steel.	14 M
	(Or)	
2	A circular room has 5m diameter from inside. Design a circular roof slab for room, to carry a superimposed load of 3750N/m^2. Assume that the slab is simply supported at the edges. Use M20 concrete and HYSD bars of Fe415 Steel.	14 M
	UNIT – II	
3	Determine the maximum factored load carrying capacity of a square column 400mmX400mm reinforced with 8 bars of 25mm diameter, uniformly spaced along all the four sides with an effective cover of 60mm. The column is braced against side sway and has unsupported length of 5.5m and effective length factor of 1 about the both axes. Assume M20 mix and Fe415 Steel.	14 M
	(Or)	
4	An un-braced column 300mmX400mm in section is un-braced in both the principal directions. The column ends are fixed and the column has unsupported length of 3.9m. The column carries an ultimate axial load of 800kN & ultimate moment of 80KN-m & 40kN-m about major axis bisecting the depth, at its ends. Assume M20 grade of concrete & Fe415 Grade steel and effective cover of 60mm. Determine the area of longitudinal reinforcement.	14 M
	UNIT – III	
5	Design a rectangular isolated footing of uniform thickness for R.C. column bearing a vertical load of 600kN and having a base size of 400mmX600mm. The safe bearing capacity of a soil may be taken as 120kN/m^2. Use M20 grade of concrete and Fe415 Grade Steel.	14 M
	(Or)	
6	Design a combined trapezoidal footing for two columns A & B spaced 5M centre to centre. Column A is 300mm X 300mm in size and transmits a load of 600kN. Column B is 400mm X 400mm size and carries a load of 900kN. The maximum length of footing is restricted to 7 metres only. The safe bearing capacity of a soil may be taken as 120kN/m^2. Use M20 grade of concrete and Fe415 Grade Steel.	14 M
	UNIT – IV	
7	Design a T-shaped cantilever retaining wall to retain earth embankment 3m high above the ground level. The unit weight of earth is 18kN/m^3 and its angle of repose is 30^o, the embankment is horizontal at its top. The safe bearing capacity of a soil may be taken as 100kN/m^2 and the	14 M

	coefficient of friction between soil and concrete as 0.50. Use M20 grade of concrete and Fe415 Grade Steel.	
	(Or)	
8	Design a T-shaped cantilever retaining wall to retain earth embankment 3m high above the ground level. The embankment is surcharged at an angle of 16^o to the horizontal. The unit weight of the earth is $18N/m^3$ and its angle of repose is 30^o. The safe bearing capacity of a soil may be taken as $100kN/m^2$ at a depth of 1m below the ground. The coefficient of friction between concrete & soil may be taken as 0.50. Use M20 grade of concrete and Fe415 Grade Steel.	14 M
	UNIT – V	
9	Design a cylindrical water tank of capacity $500m^3$ (500,000 liter) resting on the ground and having a flexible base. The materials used in the construction are M25 grade of concrete & HYSD steel of grade Fe415. The overall height of the tank is restricted to 5M with a free board of 300mm. The bearing capacity of a soil at the site is $150kN/m^2$.	14 M
	(Or)	
10	Design a rectangular water tank resting on the ground and having a capacity of 110Kl. Overall height of the tank is restricted to 4M with a free board of 300mm. The bearing capacity of soil at the site is $150kN/m^2$. The material is to be used in the construction are concrete mix of grade M25 and HYSD steel bars of Fe415 grade steel.	14 M

Sub Code: 1501703 **R 15**

K S R M College of Engineering (Autonomous), KADAPA – 516 003

B.Tech VII Sem R-15 Regular Examinations of Nov-2019

Sub: DESIGN & DETAILING OF STEEL STRUCTURES

Time: 3Hr **Max Marks: 70**

Note: Answer any Five Questions Choosing One Question from Each Unit. All Questions carry Equal Marks

IS 800-2007 & Steel Tables are permitted in the Examination Hall

	Unit-I	
1	(a) What are the assumptions made in the plastic analysis? (b) What is shape factor of the section? Find the shape factor for a solid circular section.	7 M 7 M
	(Or)	
2	A grove weld is connecting two plates 180 mm x 18 mm each. Determine the design bending strength of the joint, if it is subjected to a moment of 13 KNm. Also determine the adequate of the joint if the shear force at the joint is 200KN. Assume the weld is to be double U-shop welded Take Fe410 grade of steel & f_y= 250 N/mm^2	14 M
	Unit-II	
3.	Determine the effective net area of double angle section (2ISA 90 x 60 x 8 mm) connected to a gusset plate 12 mm in thickness for the following data Diameter of bolts = 16 mm Number of bolts = 6 Pitch of bolts = 40 mm Edge distances of bolts = 30 mm Grade of steel: Fe 410 What will be the effective net area if the angles are connected (1) Angles are connected opposite sites of gusset plate (2) Double angles are connected same side of gusset plate	14 M
	(Or)	
4	Design a battened steel column 9 m long to carry a factored axial compressive load of 1100 KN. The column is restrained in position but not in direction at both ends. Design the battened column with bolted connections. Use double channel sections back to back .the steel of grade Fe 410	14 M
	Unit-III	
5	A simply supported steel beam of 4 m effective span is laterally supported throughout. It carries a total UDL of 40KN (inclusive self weight). Design an appropriate section using steel of grade Fe 410	14 M
	(Or)	
6	Determine the design bending strength of ISLB 400@ 558.1 N/m laterally unsupported. The design shear force V is less than design shear strength. The unsupported length of the beam is 3 m. Take Fe 410 grade steel, & $\alpha_{LT = 0.21}$	14 M
	Unit-IV	
7	Design a seat connection for a factored beam end reaction of 110 KN. The beam section is ISMB 250 @ 365.9 N/m connected to the flange of column section ISHB 200 @ 365.9 N/m using bolted connections. Steel is of grade Fe 410 and bolts are of grade 4.6	14 M
	(Or)	
8	An ISLB 300 @ 369.8 N/m transmits an end reaction of 385 KN under factored loads, to the web of ISMB 450 @ 710.2 N /m. Design a bolted framed connection. Steel of grade Fe410 and bolts are of grade 4.6 Take $f_{ub =400Mpa}$ & $A_{nb=}$ 353 mm^2	14 M
	Unit-V	
9	Design a slab base for a column ISHB 350 @ 710.2 N/m subjected to an factored axial compressive load of 1500 KN for the following conditions. (i) Load is transferred to the base plate by direct bearing of column flanges.	14 M

	(ii) Load is transferred to the base plate by welded connections to column end and the base plates are not machined for bearing. When the anchor bolts are required? The base rests on concrete pedestal of grade M20	
	(Or)	
10	A column ISHB 350 @ 661.2 N/m carries an axial compressive factored load of 1700 KN. Design a suitable bolted gusset base. The base rests on M15 grade of concrete pedestal. Use 24 mm diameter bolts of grade 4.6 for making the connections.	14 M

Sub Code: 1501704 **R 15**

K S R M College of Engineering (Autonomous), KADAPA – 516 003
B. Tech VII Semester Regular Examinations, Model Paper - 2019
Sub: TRANSPORTATION ENGINEERIING – II
(Civil Engineering)

Time: 03:00 Hrs. **Max. Marks: 70**

Note: Answer All Questions.

Unit - I

1. (a)	Draw a typical cross section of a permanent way and explain the importance of its components.	8 M
(b)	Explain the ideal requirements of a permanent way	6 M
	(Or)	
2	What is meant by Creep in rails and Discuss different theories of creep in detail using neat figures	14 M
	Unit – II	
3	What is Super elevation? Derive the equation for Super elevation using the relationship between Guage (G), Speed (V) and Radius of the Curve (R)	14 M
	(Or)	
4. (a)	Define a Railway Station. Explain the factors required for selecting the site for Railway Station	8 M
(b)	Explain the ventilation of Tunnels.	6 M
	Unit – III	
5	Explain the various surveys to be conducted and data to be collected in selecting the site for an Airport.	
	(Or)	
6. (a)	What are the different corrections to be applied for basic runway length, in calculating the final runway length?	7 M
(b)	Give a typical layout of an airport indicating the Terminal area and other air side facilities.	7 M
	Unit - IV	
7. (a)	Define a Harbor. Explain the requirements of a good harbor.	7 M
(b)	Explain different types of harbors with neat sketches.	7 M
	(Or)	
8	Define Breakwater. Explain different types of breakwater with neat figures.	14 M
	Unit - V	
9	Explain the different types of dredgers and its working principle.	14 M
	(Or)	
10	What is Lock gate? Explain the maintenance of Lock gates and Caissons.	14 M

Sub Code: 1501705 **R 15**

K.S.R.M COLLEGE OF ENGINEERING (Autonomous), KADAPA-516003

B. Tech VII Semester (R15) Model Question Paper, 2020

Sub: WATER RESOURCE ENGINEERING-II

CIVIL ENGINEERING

Time: 3 hr. **Max.Marks:70**

Note: Answer ALL Questions. All Questions Carry Equal Marks.

	UNIT – I	
1 a)	What is a spillway? What are its functions? Enumerate various types of spillways?	7
b)	Compute the discharge over an ogee spillway with c_d = 2.5 at a head of 4 m, The effective length of the spillway is 100m. Neglect the velocity of approach.	7
	(Or)	
2	Discuss various methods used for energy dissipation below spillways.	14
	UNIT – II	
3 a)	What do you understand by a fall? Why it is necessary? Write a brief note on Notch type fall?	7
b)	What is cistern element in fall? Give various expressions for it in dimensions.	7
	(Or)	
4	Design a canal drop (notch type) of 2m with the following data Full supply discharge $\frac{u/s}{d/s} = \frac{4\ m3/s}{4m3/s}$ Bed width $\frac{u/s}{d/s} = \frac{6.0}{6.0}$ Bed level $\frac{u/s}{d/s} = \frac{10.0m}{8.0m}$ Full supply depth $\frac{u/s}{d/s} = \frac{1.5\ m}{1.5m}$ Full supply level $\frac{u/s}{d/s} = \frac{11.5\ m}{9.5m}$ Half supply depth = 1.0m , Top of bank is 2.0m wide at level 12.5 in u/s and 2.0m wide of a level 8.5m at d/s. The ground level at the site of work is 10.5m. Good soil is available for foundation of 8.5m.	14
	UNIT - III	
5 a)	What do you understand by Flexibility of an outlet? Derive an expression for the same.	7
b)	Distinguish clearly between non-modular and semi-modular outlets. Give examples.	7
	(Or)	
6 a)	What do you understand by a head regulator?	7
b)	Explain the procedure of designing the head regulator.	7
	UNIT - IV	
7	Describe the various types of cross-drainage works with neat sketches	14

	(Or)	
8	Write a note on selection of suitable type of cross-drainage works.	14
	UNIT - V	
9	Explain the step by step procedure of project Formulation.	14
	(Or)	
10	Explain in detail, the functional requirements in multi-purpose projects.	14

Sub Code: 1501708 **R 15**

KSRM College of Engineering (Autonomous) –Kadapa - 516003

B. Tech VII Sem Regular Examinations Model Question Paper, 2020

Sub: CONSTRUCTION PLANNING AND MANAGEMENT

Civil Engineering

Duration: 3 hrs Max Marks: 70

Note: Answer all questions. All Questions carry equal marks

	UNIT - I	
1 a)	Explain the responsibilities of a project manager	7
b)	What is the significance of Engineering drawings in construction industry	7
	(Or)	
2. a)	Enumerate the role of a construction industry in development aspect of a Nation	7
b)	Define resources and explain different resources required for construction	7
	UNIT – II	
3. a)	List out different stages of planning and explain its importance in construction	7
b)	Discuss briefly about rules for development of network	7
	(Or)	
4 a)	Differentiate between PERT and CPM	7
b)	How do critical events identify in network and explain its significance	7
	UNIT – III	
5 a)	List out different earth moving equipments and explain any one of them with neat sketch	14
	(Or)	
6 a)	What are the factors influencing to setup a RMC plant	7
b)	List out different compaction equipments and explain any one of them with neat sketch	7
	UNIT – IV	
7 a)	What is need of a inspection in construction activity	7
b)	Summarize the importance of Audit statement and Reviews in project management	7
	(Or)	
8 a)	Illustrate testing procedure followed during the inspection	7
b)	Describe the real meaning of ethical audit in construction practices	7
	UNIT – V	
9 a)	List out different organizations and explain merits and demerits of line organization	7
b)	Discuss briefly on Risk benefit analysis	7
	(Or)	
10 a)	What are the factors influencing to implement job layout for a construction project	7
b)	Define safety in construction and explain what are the safety measures taken in construction	7

Code: 1502702

K.S.R.M. College of Engineering (Autonomous): KADAPA

B.TECH VII SEM EEE (R15) Model Question Paper

Electrical and Electronics Engineering

Sub: Advanced Control Systems

Time: 3 Hours Max. Marks: 70

Answer FIVE questions, choosing ONE question from each Unit.

All questions carry equal marks.

UNIT-I

1. Consider a unity feedback system with open loop transfer function, $G(S) = \frac{K}{S(s+8)}$. Design a suitable lead Compensator to meet the following specifications. (i) Percentage peak overshoot =9.5% (ii) Natural frequency of oscillation, ω_n = 12 rad/sec (iii) Velocity error constant, $K_v \geq 10$. (14M)

(Or)

2. Consider a unity feedback system with open loop transfer function, $G(S) = \frac{20}{S(S+2)(S+4)}$. Design a PD Controller so that the closed loop has a damping ratio of 0.8 and the natural frequency of oscillation as 2 rad/sec. (14M)

UNIT-II

3. a) Determine the Canonical state model of the system. Whose Transfer function is $T(S) = \frac{2(S+5)}{[(S+2)(S+3)(S+4)]}$ (7M)

   b) Diagonalize the give system $\dot{X} = AX + BU; \quad Y = CX$

   Where $A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -6 & -11 & -6 \end{bmatrix}$; $B = \begin{bmatrix} 0 \\ 0 \\ 2 \end{bmatrix}$ $and\ C = [1 \quad 0 \quad 0]$ (7M)

(Or)

4. What is Controllability? Determine whether the given system $\dot{X} = AX + BU; \quad Y = CX$ is Controllable or not.

   Where $A = \begin{bmatrix} 0 & 0 & 1 \\ -2 & -3 & 0 \\ 0 & 2 & -3 \end{bmatrix}$; $B = \begin{bmatrix} 0 \\ 2 \\ 0 \end{bmatrix}$ $and\ C = [1 \quad 0 \quad 0]$ (14M)

UNIT-III

5. a) Derive the solution of the state equation for the Homogeneous system. (10M)

   b) Write down the properties of STM (4M)

(Or)

6. Consider a linear system described by the transfer function

$$\frac{Y(s)}{U(s)} = \frac{10}{s(s+1)(s+2)}$$

   Design a State Feedback controller with a state feedback so that the closed loop poles are placed at s= -2, s= -1+j, and -1-j (using Ackermann's Formula) (14M)

UNIT-IV

7. Derive the Describing Function for the Dead-zone and Saturation Non-Linearity. (14M)

(Or)

8. A linear second order servo is described by the equation $\ddot{e} + 2\zeta\omega_n\dot{e} + \omega_n^2 e = 0$ where ζ=0.15, $\omega_n = 1\ rad/sec$, $e(0) = 1.5$ and $\dot{e}(0) = 0$. Determine the singular point. Construct the phase trajectory, using the method of isoclines. (14M)

UNIT-V

9. a) Write down the Liapunov Stability and instability Theorems. (8M)
   b) Consider a non-linear system governed by the equations
   $\dot{x_1} = -x_1 + 2x_1^2 x_2$ *and* $\dot{x_2} = -x_2$ Determine the Stability (6M)

(Or)

10. a) Consider a linear autonomous system described by the state equation $\dot{X} = AX$. Prove that the system has a unique solution $A^T P + PA = -Q$. Where P and Q are Positive Definite matrices. (10M)

    b) Consider the Second-order system described by $\begin{pmatrix}\dot{x_1}\\ \dot{x_2}\end{pmatrix} = \begin{pmatrix}0 & 1\\ -1 & -1\end{pmatrix}\begin{pmatrix}x_1\\ x_2\end{pmatrix}$ (4M)
    Determine the Stability of the system, whose equilibrium state is the origin.

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Code: 1502703

K.S.R.M. College of Engineering (Autonomous): KADAPA

B.TECH VII SEM EEE (R15) Model Question Paper

Electrical and Electronics Engineering

Sub: HVDC Transmission

Time: 3 Hours Max. Marks: 70

Answer FIVE questions, choosing ONE question from each Unit.
All questions carry equal marks.

UNIT-I

1. a) Explain the comparison of AC & DC transmission in detail.
   b) Explain the major components of a hvdc transmission in converter station unit.

OR

2. a) With neat sketches explain the different kinds of dc links available?
   b) Explain the modern trends in dc transmission systems?

UNIT-II

3. a) Explain the choice of converter configuration for any pulse number.
   b) Draw the schematic circuit diagram of a 6 pulse graetz's circuit and explain its principle of operation.

OR

4. a) Explain the effect of overlap angle on the performance of converter circuit.
   b) Explain the converter bridge characteristics with neat sketches.

UNIT-III

5. a) Discuss in detail the principle of DC link control.
   b) Discuss in detail about the converter control characteristics of HVDC systems.

OR

6. a) Explain firing angle control, and draw-backs of EPC and IPC schemes.
   b)Explain about the starting and stopping of a DC link.

UNIT-IV

7. a) What are the main types of faults in converters and converter stations?
   b) Derive the expression for short circuit in a bridge, and briefly explain the reasons.

OR

8. a) Give the principle of different types of DC circuit breaker schemes.
   b) Why is a surge diverter needed across the DC circuit breaker.

UNIT-V

9. a) What is the reactive power requirement in steady state, discuss the various sources of reactive power for HVDC converters.
   b) Mention the various sources of harmonic generation in HVDC systems and suggest methods to eliminate them.

OR

10. a) Give a detailed account of design aspects of following filters
    i) single tuned filter ii) double tuned filter
    b) Explain the need to employ filter circuit in HVDC systems. Derive an expression for minimum cost of tuned AC filters used in HVDC systems.

Code: 1502704

K.S.R.M. College of Engineering (Autonomous): KADAPA

B.TECH VII SEM EEE (R15) Model Question Paper

Electrical and Electronics Engineering

Sub: Switch Gear & Protection

Time: 3 Hours Max. Marks: 70

Answer FIVE questions, choosing ONE question from each Unit.
All questions carry equal marks.

UNIT-I

1. a) What are causes for over voltages arising in power systems? Why it is necessary to protect the lines and other equipment of the power system against over voltages?
   b) What are protective measures taken against lightning over voltages?

OR

2. a) Describe the construction and principle of operation of Valve type lightning arrester?
   b) What is Peterson coil? What protective function performed by this device?

UNIT-II

3. a) Explain the arc phenomena and arc interruption methods?
   b) Explain the terms recovery voltage restriking voltage and RRRV , Derive the expression for the restriking voltage in terms of system capacitance and inductance?

OR

4. a) Explain the phenomena of current chopping in a circuit breaker. What measures are taken to reduce it?
   b) Explain the operation of SF6 circuit breaker. What are the advantages over the other types?

UNIT-III

5. a) What is protective relay? What are the fundamental requirements of protective relaying?
   b) Discuss the principle of operation of induction disc relay? Also show that the torque is maximum when the phase angle difference between the two fluxes is 90^0.

OR

6. a) Describe the operating characteristics of impedance and admittance type relays and derive necessary equations from universal torque equation.
   b) Explain the advantages and disadvantages of static relays.

UNIT-IV

7. a) A 11 KV 100MVA alternator is grounded through a resistance of 5 ohms. The C.T s has a ratio 1000/5. The relay is set to operate when there is an out of balance current of 1 amps. What percentage of the generator winding will be protected by the percentage differential scheme of protection?
   b) Discuss the protection employed against loss of excitation of a generators.

OR

8. a) Explain the connection of transformer differential relays
   b) What is Buchholtz relay? Which equipment is protected by this? For what type of faults it is employed? Discuss its working principle.

UNIT-V

9. a) With a neat sketch discuss the differential scheme for bus-zone protection.
   b) Explain the carrier current protection scheme for transmission lines.

OR

10. a) Explain the three zone distance relay protection scheme.
    b) What are requirements of protection of lines , What is the importance of bus - bar protection.

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K.S.R.M. College of Engineering (Autonomous): KADAPA Code: 1502705

B.TECH VII SEM EEE (R15) Model Question Paper

Electrical and Electronics Engineering

Sub: Electrical Distribution Systems

Time: 3 Hours Max. Marks: 70

Answer FIVE questions, choosing ONE question from each Unit.
All questions carry equal marks.

UNIT I

1. (a) Define Load Factor, Diversity factor, Coincidence Factor, Contribution Factor and Loss Factor.
   (b) Classify different types of loads and their characteristics.

(OR)

2. (a) Derive the relationship between Load Factor and Loss Factor.
   (b) A power station has to supply four consumers having peak values of 10,000KW, 5000KW, 8000KW and 7000KW respectively. The diversity factor of the load at the station is 15 and the average annual load factor is 50%. Calculate maximum demand on the power station and the annual energy supplied by the station.

UNIT II

3. (a) Discuss the relative merits and demerits of Underground and Overhead system.
   (b) Explain basic design practice of Secondary Distribution System.

(OR)

4. (a) Explain Radial Type Primary Feeder with neat diagram.
   (b) A 2-wire dc distributor AB is 300m long. The end A is fed at 205V and end B at 200V. The distributor is uniformly loaded at 0.15 A/m length and has concentrated loads of 50A, 60A and 40A at point distant 75,175 and 225m respectively from end A. The resistance of each conductor is 0.15 ohm/km. Calculate 1) the point of minimum potential 2) current fed at ends A and B.

UNIT III

5. (a) What are the factors to be considered for selecting location of substations?
   (b) Explain the single bus-bar system with sectionalization and what are its merits and demerits?

(OR)

6. (a) Derive the relationship for power loss and voltage drop for sub-station service area with 'n' primary feeders.
   (b) Discuss the comparison between Indoor and Outdoor Substations.

UNIT IV

7. (a) Derive the approximate voltage drop and power loss equation of primary feeder of a non-uniformly distributed loads.
   (b) How is the economical power factor arrived for a given distribution system with different loads.

(OR)

8. (a) List the various causes of low power factor and explain any two methods for improving power factor.
   (b) A 3Φ, 5KW induction motor has a p.f. of 0.85 lag. A bank of capacitor is connected in delta across the supply terminal and p.f. raised to 0.95 lag. Determine the KVAR rating of the capacitor in each phase.

UNIT V

9. (a) Explain briefly about SCADA in Distribution Automation.
   (b) Discuss about Consumer Information System, Geographical Information System and Automatic Motor Reading.

(OR)

10. (a) Explain Distribution Automation, benefits of Distribution Automation and various function of Distribution Automation in distribution system.
    (b) Explain Automatic Switching Controls, Ethernet, Man Machine Interface, Remote Terminal Units and Work Station in Distribution Automation.

Code: 1502707

K.S.R.M. College of Engineering (Autonomous): KADAPA

B.TECH VII SEM EEE (R15) Model Question Paper

Electrical and Electronics Engineering

Sub: Power Quality

Time: 3 Hours Max. Marks: 70

Answer FIVE questions, choosing ONE question from each Unit.
All questions carry equal marks.

UNIT-I

1. a) Explain the power Quality Evaluation Procedure? (8M)
   b) Draw and explain CBEMA and ITI curves in detail. (6M)

(Or)

2. What is Power Quality? Explain in detail different power quality issues. (14M)

UNIT-II

3. a) Define and explain about transients? (7M)
   b) Explain the important causes of voltage sags? (7M)

(Or)

4. Explain briefly about transient over voltages due to lightning? (14M)

UNIT-III

5. a) Explain in detail how harmonics are generated from Industrial loads? (8M)
   b) What are the causes of harmonics in power system? (6M)

(Or)

6. a) What are harmonics? What are its effects on different electrical equipments? (8M)
   b) Define and explain total harmonic distortion. (6M)

UNIT-IV

7. a) Explain about various power quality measuring equipment? (7M)
   b) What are the main objectives of power quality monitoring? (7M)

(Or)

8. Describe the process of power quality Bench marking? in detail. (14M)

UNIT-V

9. Explain the following.
   a) Solid state current limiter (7M)
   b) Solid state transfer switch (7M)

(Or)

10. Explain the following
    a) Dynamic voltage restorer (7M)
    b) Solid state breaker (7M)

*****

R 15

Code: 1503701

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

-VII semester (R15) Regular Examinations, January '2021

CAD- CAM

(Mechanical Engineering)

MODEL QUESTION PAPER

Time:3 hrs **Max Marks: 70**

Answer five questions. Selecting one Question from each unit

All Questions carry equal marks

UNIT - I

1) Explain about CRT in detail, with the help of neat diagram

OR

2) Explain about different computer configurations used in CAD applications

UNIT - II

3) Explain about the following terms in view of 2D transformations

a) Translation b) Rotation c) Scaling d) Reflection e) Mirroring

OR

4) Explain about clipping in detail with the help of an example

UNIT – III

5) what is meant by Space curves, explain about space curves in detail

OR

6) Differentiate between surface and solid modeling

UNIT - IV

7) Explain about coding and classification system in group technology

OR

8) Explain about applications of robot in material handling and in manufacturing

UNIT – V

9) What is meant by CAPP, explain about generative CAPP in detail?

OR

10) Explain about bar code technology concept and its uses

Code: 1503702 **R 15**

K.S.R.M COLLEGE OF ENGINEERING, KADAPA (AUTONOMOUS)
VII semester (R15) Regular Examinations January 2021
METROLOGY
(*Mechanical Engineering*)
MODEL QUESTION PAPER

Time: 3 hrs **Max Marks: 70**

Answer five questions. Selecting one Question from each unit
All Questions carry equal marks

Unit-I

1. a) Name and sketch three main types of fits. (6marks)
b) A hole and mating shaft are to have a nominal assembly size of 40mm the assembly is to have maximum clearance of 0.15mm and minimum clearance of 0.05mm the hole tolerance is 1.5 times the shaft tolerance .Determine the limits for both hole and shaft. By using hole basis system and shaft basis system. (8marks)

(OR)

2. a) Difference between hole basis system and shaft basis system. (7marks)
b) Explain terms interchangeability and selective assembly enumerates the differences between them. (7marks)

Unit-II

3. a) Differentiate between line standard and end standard. (7marks)
b) Explain various methods of measuring angles and tapers. (7marks)

(OR)

4. a) Explain Taylor's Principle of gauge design. (7marks)
b) Explain the phenomenon of ringing. and the grades of slip gauge. (7marks)

Unit-III

5. a) Describe with a neat sketch working principle of a Autocollimator. (7marks)
b) Describe with a neat sketch working principle of a NPL gauge interferometer. (7marks)

(OR)

6. a) Explain about Tomlinson surface meter. (7marks)
b) Explain about visual gauging head is incorporated in multi gauging machines. (7marks)

Unit-IV

7. a) Explain about two wire and three wire method. (7marks)
b) Describe the pitch measurement of internal screw threads by various methods.(7marks)

(OR)

8. a) Enlist the instruments and equipment essential for performing alignment tests. (6marks)
b) Explain in detail with suitable sketches about various alignment tests performed on a lathe. (8marks**)**

Unit-V

9. a) Define CMM write the application of CMM. (6marks)
b) Explain the working principle of Parkinson gear tester. (8marks)

(OR)

10. a) write the advantages and dis advantages of mechanical comparator (6 marks)
b) Explain the working principle of pneumatic comparators. (8 marks)

R 15

Q.P CODE:1503703

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

VII Sem (R15)Final Examinations, January 2021

Subject: Finite Element Methods

(*Mechanical Engine*ering)

MODEL QUESTION PAPER

Time: 3hrs. **Max marks: 70**

Note: Answer Any Five questions. Choosing one from each unit.

All questions carry Equal marks

UNIT-1

1).a). Explain the step by step procedure of FEA. (4M)

b).The following differential equation is available for a physical phenomenon, $d^2y/dx^2 - 10x^2 = 5$, $0 \le x \le 1$with boundary conditions as y (0) = 0 and y (1) = 0. Find an approximate solution of the above differential equation by using Galerkin's method of weighted residuals and also compare with exact solution. (10M)

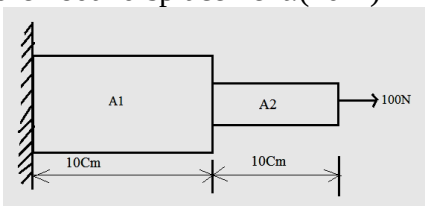
(OR)

2).Consider the differential Equation for a problem such as $\frac{d^2y}{dx^2} + 300\,x^2$; $0 \le x \le 1$ with in the boundary conditions y(0) = y(1) =0, the functional corresponding to this problemto be Extremized is given by $I=\int_0^1 \left\{\frac{1}{2}\left(\frac{dy}{dx}\right)^2 + 300x^2y\right\}dx$ .Find the solution of the problem using Ralyeigh Ritz method using a one term trial solution as y=a $x(1-x^3)$

UNIT-2

3). Deduce the stiffness matrix for a 1D two noded linear elementand Show that in what way the global stiffness matrix differs from element stiffnessmatrix?(4M)

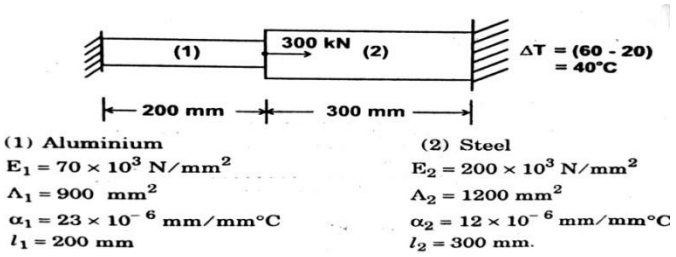
b) Consider a bar as shown in fig. Young's Modulus E= 2 x 105 N/mm^2. A1 = 2cm^2, A2 = 1cm^2 and force of 100N. Calculate the nodal displacement.(10M)



(OR)

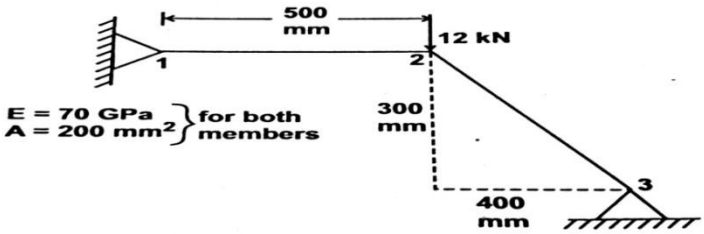
4).An axial load of 3×10N is applied at 20°C to the rod as shown in Fig.This temperature is then raised to 60°C.Calculate the following;

Assemble the K and F matrices (b) Nodal displacements c) Stresses in each material (d) Reactions at each nodal point (14M)



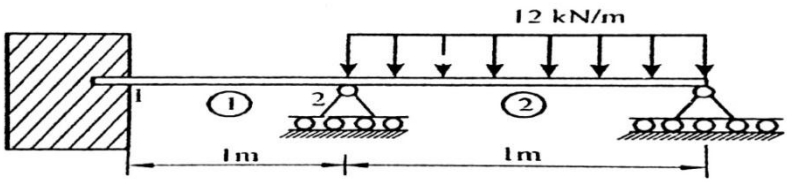
UNIT-3

5). For the Two bar Truss shown in figure, determine the displacements of node 2 and the stress in both elements(14M)



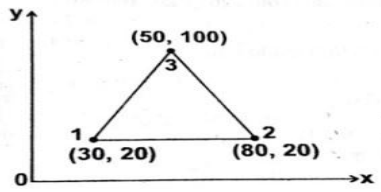
(OR)

6). Solve for vertical deflection and slopes, at point 2 and 3, using beam elements for the structure shown in figure. Also determine the deflection at the centre of the portion of the beam carrying UDL. E=200 GPa, I=4x10^6 mm^4



UNIT -4

7).For the plane stress element shown in figure,Evaluate the stiffness matrix. Assume modulus of elasticity E=210x10^3 N/mm^2. Poisson's ratio μ=0.25 and element thickness t=10 mm .The coordinates are given in mm. (14M)



(OR)

8).Derive temperature function (T), shape Function (N) and Stiffness matrix for one dimensional Heat conduction. (14M)

UNIT-5

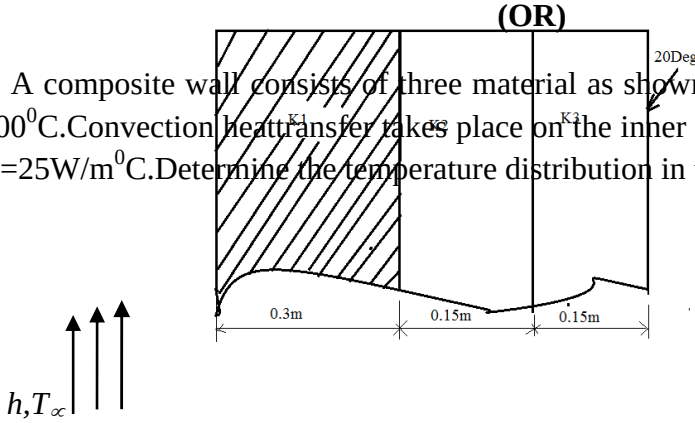
9). Explain the following Terms(14M)

a).Iso Parametric element b).Super parametric element

c).Sub parametric element d).Axi symmetric element

(OR)

10). A composite wall consists of three material as shown below. The outer temperature is $T_0=200^0$C.Convection heattransfer takes place on the inner surface of the wall with T $=800^0$C and h=25W/m^0C.Determine the temperature distribution in the wall.



$K_1=20W/m^0c$

$K_2=20W/m^0c$

$K_3=20W/m^0c$

$H=25W/m^0c$

$T_\infty=800^0C$

R 15

Code: 1503704

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

VII semester (R15) Regular Examinations January, 2021

INSTRUMENTATION AND CONTROL SYSTEM

(*Mechanical Engineering*)

MODEL QUESTION PAPER

Time: 3 hrs **Max Marks: 70**

Answer FIVE questions. Selecting one Question from each unit

All Questions carry equal marks

.

Unit-1:-

1) a) what is measurement system and explain its elements? (7M)

b) Explain briefly the application of measuring systems / instruments? (7M)

(OR)

2) a)What are the different measurement methods? Explain briefly? (7M)

b) What are the different types of errors in the measurement? Explain briefly? (7M)

Unit -11:-

3) a) Explain the operating principle of an LVDT with a diagram? (7M)

b) Describe the working principle of an electrical resistance thermometer? (7M)

(OR)

4) a)Describe the working principle of pirani gauge with neat sketch? (7M)

b) Explain the concept of pressure measurement using diaphragm gauges? (7M)

Unit-111:-

5) a) what are bubbler level indicators? Describe their working? (7M)

b) Describe with a neat sketch, the principle of operation of a laser Doppler anemometer. (7M)

(or)

6) a) Explain the working principle of a vibrometer with a neat sketch? (7M)

b) Describe the working principle of stroboscope with a neat sketch? (7M)

Unit -1V:-

7) a) what is strain gauge rosette? Explain its importance. (7M)

b) what are different types of strain gauges? Explain briefly? (7M)

(or)

8) a) Distinguish between bonded and unbounded type of strain gauge? (7M)

b) what is temperature compensation in strain gauge? How is it achieved? (7M)

Unit – V

9) a) Describe how the torque and power are measure of by using a prony brake dynamometer? (7M)

b) How is a hydraulic cell used for force measurement? Explain. (7M)

(or)

10) a) Describe the working principles of a dew point meter with a neat sketch? (7M)

b) What are the different types of control system? Explain term with block diagrams? (7M)

Code: 1503705

R 15

K.S.R.M COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
VII semester (R15) Regular Examinations, January 2021
PRODUCTION AND OPERATIONS MANAGEMENT (ELECTIVE III)
(Mechanical Engineering)

MODEL QUESTION PAPER

Time: 3 hrs **Max Marks: 70**

Answer FIVE questions. Select one Question from each unit
All Questions carry equal marks

Unit-I

1. Define production system .Explain various components of production system (14M)

(OR)

2 a) Explain flexible manufacturing system (7M)
b) Explain principles of lean manufacturing system (7M)

Unit-II

3. a) State the objectives of forecasting (4M)
b) For the data given in Table1 determine the best line of fit and determine the forecast for 8th and 9th year and also determine coefficient of determination and standard deviation

Table 1: Sales data

Year	1	2	3	4	5	6	7
Sales of books in 000's	14	17	15	23	18	22	27

(10M)

(OR)

4) a Explain various strategies ,costs and methods in aggregate production planning (14M)

Unit-III

5. Explain various types of layouts (14)

OR

6. Assembly of a job should be done as per the information given in Figure 1 and the cycle time is 45 seconds. Calculate number of workstations and balance delay using RPW method.

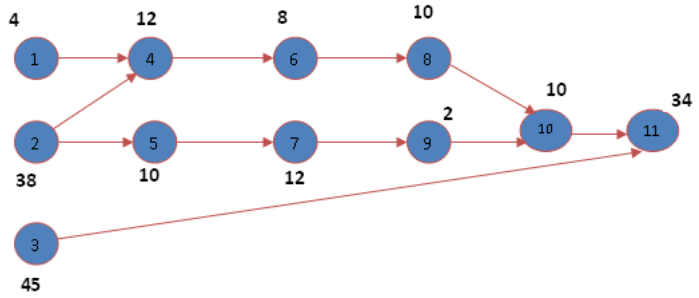


Figure1: Precedence diagram

Unit-IV

7. (a) Explain various costs of inventory? (4M)

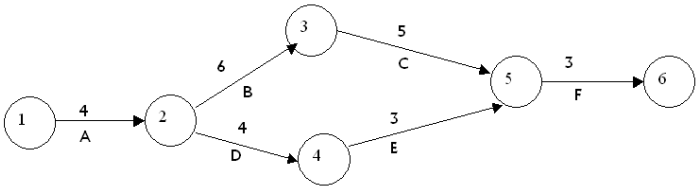
(b) Given the data for an item of uniform demand, instantaneous delivery time and back order facility. Annual demand=800 units; Cost of an item=Rs40; Ordering cost=Rs.800/order; Inventory carrying cost =40%/unit/year. Back order cost= Rs 10/unit/year. Find out

I. Economic order quantity
II. Maximum number of backorders
III. Time between orders
IV. Total annual cost
V. Maximum inventory

(10M)

OR

8. A small engineering project consists of 6 activities namely A, B, C, D.E and F with duration of 4, 6,5,4,3 and 3 days. Details are shown in the network diagram (Figure2). Calculate EST, LST, EFT, LFT and floats. Mark the critical path and find total project duration



(14M)

Figure2: Network diagram

Unit-V

9. a) What are the assumptions made in sequencing problems (4M)

b) Find the sequence that minimizes the total elapsed time for 10 jobs through 2 machines M_1M_2 shown in Table 2. Find also total elapsed time (10M)

Table 2:

Job	A	B	C	D	E	F	G	H	I	J
Time on M_1	7	3	10	8	13	9	5	11	7	10
Time on M_2	6	5	15	7	12	12	2	8	5	11

(OR)

10. (a)Explain various priority rules (4M)

(b) Table 3 gives jobs that are waiting to be processed at a small machine center.

Table3: Processing time and due date for jobs

Job	1	2	3	4	5
Due date	260	258	260	270	275
Duration (Days)	30	16	8	20	10

In what sequence would the jobs to be ranked according to (i) FCFS & (ii) LPT. All dates are specified as manufacturing calendar day, Assume that all jobs arrive on day 210. Which is the best decision rule? (10m)

R 15

Code: 1503710

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

B.Tech VII Semester Regular Examinations, January 2021

RAPID PROTOTYPING

Model Question Paper

Time:3 Hrs **Max marks:70**

Answer any five questions, choosing one question from each unit.
All questions carry equal marks

UNIT-I

1). a) Define rapid prototyping and its importance briefly?
b) Discuss about history of RP system

(Or)

2).a) Explain the Classification of RP system?
b) Discuss in detail Survey of Applications in Rapid prototyping systems?

UNIT-II

3).With a neat sketch explain stereo lithography process & its advantages and disadvantages?

(Or)

4).Explain Process parameters, process details& applications of stereo lithography?

UNIT-III

5).Discuss various process parameters and applications of fusion decomposition modeling ?

(Or)

6).With neat sketch explain solid ground curing?

UNIT-IV

7).Explain working principle of laminated object manufacturing and its applications

(Or)

8).Explain the following
i) Thermal jet printer
ii) 3D Printer
iii)Genisys Xs printer

UNIT-V

9). Explain the following
i) Direct ACES injection moulding
ii) ARC Spray metal tooling
iii) 3D keltool and Eco tool

(Or)

10).Explain Factors influencing accuracy, Part building error, &Error in finishing

Code No: 1504702

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

B. Tech VII Sem (R15) ECE Model Paper

Subject: VLSI design

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 CMOS fabrication in P-well process. 6M
   (b) Explain substrate preparation technique along with neat diagram. 8M

(OR)

2. (a) Explain NMOS fabrication steps in detail. 8M
   (b) Explain Integrated resistors and capacitors. 6M

UNIT-II

3. (a) what is threshold voltage of a MOS device and explain its significance. 8M

   (b) Explain NMOS inverter analysis. 6M

(OR)

4. Explain I_{ds} V_s V_{ds} relationships in saturation and non-saturation regions. 14M

UNIT-III

5. Design a stick diagram and layout of two input CMOS NAND and NOR gates. 14M

(OR)

6. (a) Write Scaling factors of MOS circuits. 8M
   (b) Explain limitations of scaling briefly. 6M

UNIT-IV

7. (a) Explain alternate gate circuits in gate level design. 10M
   (b) Define sheet resistance and wiring capacitance. 4M

(OR)

8. (a) Explain parity generators in sub system design. 8M
   (b) Explain high density memory elements. . 6M

UNIT-V

9. Explain about PLA'S, FPGA'S and CPLD'S design. 14M

(OR)

10. (a) Explain CMOS testing in detail. 7M
    (b) Explain layout design for improved Testability. 7M

Subject code: 1504703

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

B. Tech VII Sem (R15) ECE Model Paper

Subject: **ELECTRONIC MEASUREMENTS AND INSTRUMENTATION**

Time: 3 Hours Max. Marks: 70

Answer any FIVE questions,
Choosing one Question from each unit.
Answer any five questions, choosing **ONE** question from each unit.
All questions carry equal marks.

UNIT-I

1 (a) Define the terms **4M**
(i) Accuracy (ii) Precision (iii) Resolution (iv) Sensitivity.
(b) What are the Sources of Errors? How do you reduce the error in an Instrument? **10M**

OR

2 (a) Describe Construction and principle of Chopper type micro Voltmeter. **7M**
(b) Explain about the Harmonic Distortion Analyzer **7M**

UNIT-II

3. Describe Construction and principle of Dual Slope Voltmeter. **14M**

OR

4 (a) Describe Construction and principle of Digital Multimeter. **10M**
(b) It is desired to extend the range of a 10mA Ammeter with Rm=100 Ω to measure 15A. Draw the circuit and determine the value of R. **4M**

UNIT-III

5. Discuss about the CRT and internal structure. **14M**

OR

6. Give the principle of
(i) Dual Beam CRO **7M**
(ii) Dual trace Oscilloscope **7M**

UNIT-IV

7 (a) Discuss the principle of Maxwell's bridge. **4M**
(b) In the case of Maxwell's bridge, one arm has resistance of 1K Ω, in another arm has also only resistance of 5K Ω. The third arm has a resistor 4-7k Ω in shunt with a capacitor of 1μF. The bridge is excited at frequency of 1KHz.Determine the Values of an unknown Lx in the fourth arm. **10M**

OR

8 (a) Discuss the principle of Andersons Bridge with a neat sketch. **10M**
(b) Give the Applications of Andersons Bridge **4M**

UNIT-V

9 (a) Discuss the principle of operation of strain gauges? **8M**
(b) A resistance strain gauge with a gauge factor of 2 is cemented to a steel member, which is subjected to a strain of 1x10-6 . If original resistance value of the gauge is 130 Ω, calculate the change in resistance. **6M**

OR

10. Describe about Data Acquisition Systems **14M**

Subject code: 1504704

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

B. Tech VII Sem (R15) ECE Model Paper

Subject: OPTICAL COMMUNICATIONS

Time: 3 Hours Max. Marks: 70

Answer any FIVE questions,
Choosing one Question from each unit.

UNIT-1

1. (a) What is the concept of ray theory transmission? Explain with a suitable optical Cable Setup.
   (b) Draw the block diagram of optical fiber communication system and explain about each block.

(OR)

2. (a) Discuss the advantages of optical fibers over conventional coaxial cables.
   (b) A graded index fiber has a core with a parabolic refractive index profile which has a diameter of 50μm. The fiber has a NA of 0.2. Estimate the total number of guided modes propagating in the fiber when it is operating at a wavelength of 1μm.

UNIT-2

3. (a) Explain the mechanical properties of fibers.
   (b) List out the requirements for selecting materials in optical fibers and also explain about the following: (a) Halide glass fibers.
   (b) Active glass fibers.

(OR)

4. (a) Explain about the following:
   (i) Material dispersion.
   (ii) Wave guide dispersion.
   (b) A 6Km optical link consists of multi mode step index fiber with n_1=1.5 and Δ=1% estimate
   (i) The delay difference between the slowest and fastest modes at the fiber output.
   (ii) The rms pulse broadening due to inter modal dispersion on the link.

UNIT-III

5. (a) Illustrate various types of misalignments resulting in losses while splicing and joining optical fibers.
   (b) Explain about fiber splicing.

(OR)

6. (a) Explain lensing schemes for coupling efficiency improvement.
   (b) A DH surface emitter which has an emission area diameter of 50μm is butt jointed to an 80μm core step index fiber with a NA of 0.15. The device has a radiance of 30 W/sr cm^2 and a constant operating drive current. Estimate the optical power coupled into the fiber if it is assumed that the Fresnel reflection coefficient at the index matched fiber surface is 0.01.

UNIT-IV

7. (a) Write short notes on LASER diode modes
   (b) Explain the surface emitters and edge emitter LEDS.

(OR)

8. (a) Explain about avalanche photo diode.
   (b). A given silicon APD has a quantum efficiency of 65% at a wavelength of 900nm if 0.5μw of optical power produces a multiplied photo current of 10μA then what is the multiplication

UNIT-V

9. (a) What is WDM? Explain the features of WDM?
   (b) What is the significance of system consideration in point-to-point fiber links? Explain.

(OR)

10. (a) Explain the rise time budget in detail.
   (b) Briefly explain the following
      (i) OTDR
      (ii) Eye pattern

Subject Code: 1504705

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

B. Tech VII Sem (R15) ECE Model Paper

Subject: **DIGITAL IMAGE PROCESSING**

Time: 3 Hours Max. Marks: 70

Answer any FIVE questions,
Choosing one Question from each unit.

UNIT I

1.(a) What are the various fundamental steps of digital image processing? Explain. 7

(b) Explain the following: i) neighbors of a pixel ii) Adjacency 7

OR

2. (a) Explain with a neat figure the basic idea behind sampling and quantization of an image. 7

(b) Explain image formation model. 7

UNIT II

3. (a) Explain about discrete cosine transform and write it's properties. 7

(b) Explain the following properties of 2D – DFT

i) Translation ii) Separability 7

OR

4 (a) Explain KL transform. 7

(b) Obtain hadamard transform matrix for N=4. 7

UNIT III

5 (a) Explain point processing techniques of image enhancement. 14

OR

6 (a) Define histogram of a digital image. Sketch the histograms of dark, light, low contrast and high contrast images. 7

(b) Discuss about homomorphic filtering and explain how it is related to image model. 7

UNIT IV

7 (a) Explain the three types of redundancies in images. 7

(b) Obtain the Huffman code for the word 'COMMITTEE' 7

OR

8 (a) Explain about transform coding in image compression. 7

(b) Explain image compression model and explain what is the difference between lossless and lossy compression. 7

UNIT V

9 (a) Explain how the image gradient is useful in edge detection. 7

(b) Explain image segmentation using region splitting and merging. 7

OR

10 (a) Explain image restoration using inverse filtering. Write the advantages and disadvantages of this method. 7

(b) Derive an expression for unconstrained restoration using algebraic approach. 7

Subject code: 1504706

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

B. Tech VII Sem (R15) ECE Model Paper

Subject: EMBEDDED REAL TIME OPERATING SYSTEMS

Time: 3 Hours Max. Marks: 70

UNIT-I

1. (a) What are the various application areas of Embedded systems. 6M
   (b) Explain classification of Embedded Systems. 8M

(OR)

2. (a) Explain Operational Quality attributes of Embedded system. 8M
   (b) Explain communication interface briefly. 6M

UNIT-II

3. (a) Explain the role of digital and analog electronic components in embedded hardware design. 10M
   (b) Explain the hardware software tradeoffs 4M

(OR)

4. Explain computational models in embedded system design. 14M

UNIT-III

5. (a) Explain various serial and parallel communication devices. 8M
   (b) Explain watchdog timer and real time clock. 6M

(OR)

6. (a) Explain network protocols in embedded systems 8M
   (b) Explain various I/O types and examples 6M

UNIT-IV

7. Explain Basic functions of real time kernel. 14M

(OR)

8. (a) Explain interrupt routines in RTOS environment? 8M
   (b) Explain OS security issues . 6M

UNIT-V

9. With neat diagram explain embedded system for an Adaptive cruise control system in a car. 14M

(OR)

10. With a neat diagram explain smart card hardware. 14M