

K S R M College of Engineering (Autonomous), KADAPA – 516 003  
B.Tech 6<sup>th</sup> Semester (R18) Regular Examinations, 2021  
Concrete Technology  
(Civil Engineering)

Time: 03:00 Hrs.

Max. Marks: 70

---

Note: All questions will carry equal marks

**Unit – 1**

- |   |   |  |         |
|---|---|--|---------|
| 1 | a | Explain briefly about The Heat of Hydration ?                | 7 Marks |
|   | b | Describe briefly about Plasticizers and super plasticizers ? | 7 Marks |

Or

- |   |   |   |         |
|---|---|---|---------|
| 2 | a | Write a short notes on Physical properties of cement ?              | 7 Marks |
|   | b | Describe briefly about Accelerators and Accelerating Plasticizers ? | 7 Marks |

**Unit – 2**

- |   |   |   |         |
|---|---|---|---------|
| 3 | a | Discuss briefly about the Shape and Size of Aggregates ?      | 7 Marks |
|   | b | Explain briefly about the Factors affecting the Workability ? | 7 Marks |

Or

- |   |   |   |         |
|---|---|---|---------|
| 4 | a | Describe briefly about the Moisture content of Aggregates ? | 7 Marks |
|   | b | Write a brief notes on Slump cone Test ?                    | 7 Marks |

**Unit – 3**

- |   |   |   |         |
|---|---|---|---------|
| 5 | a | Explain briefly about Poisson's Ratio ?                 | 7 Marks |
|   | b | What are the different Thermal properties of Concrete ? | 7 Marks |

Or

- |   |   |   |         |
|---|---|---|---------|
| 6 | a | Write a short notes on Dynamic Modulus of concrete ?            | 7 Marks |
|   | b | Define Chemical attack and how it is attacked to the concrete ? | 7 Marks |

**Unit – 4**

- |   |   |  |         |
|---|---|--|---------|
| 7 | a | Define Curing ? Explain briefly about any Two curing methods ? | 7 Marks |
|   | b | Describe briefly about Rebound Hammer Test ?                   | 7 Marks |

Or

- |   |   |   |         |
|---|---|---|---------|
| 8 | a | Write a short notes on Maturity of Concrete ?         | 7 Marks |
|   | b | Describe briefly about Compression test of concrete ? | 7 Marks |

**Unit – 5**

- |   |   |          |
|---|---|----------|
| 9 | What are the various steps while you are designing the ACI method ? | 14 Marks |
|---|---|----------|

Or

- 10 Design a concrete mix for construction of an elevated water tank. The specified design strength of concrete (characteristic strength) is 30 Mpa at 28 days measured on standard cylinder. Standard deviation can be taken as 4Mpa. The specific gravity of FA and CA are 2.65 and 2.7 respectively. The dry rodded bulk density of CA is  $1600\text{kg/m}^3$  and fineness modulus of FA is 2.8. Ordinary Portland cement will be used. A slump of 50mm is necessary. CA is found to be absorptive to the extent of 1 % and free surface moisture in sand is found to be 2%. Assume any other essential data. 14 Marks

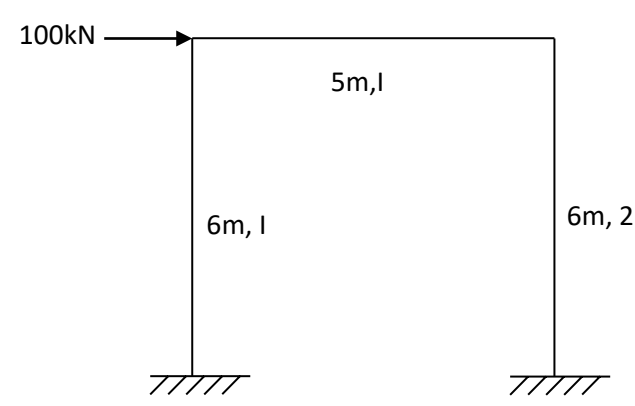
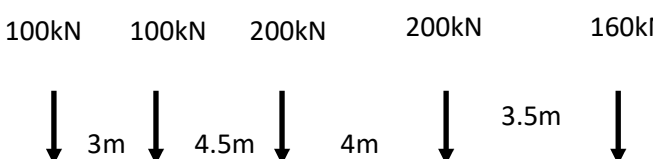
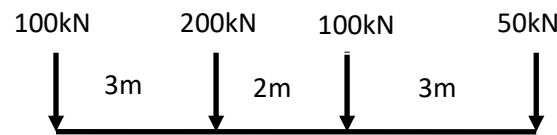
K S R M College of Engineering (Autonomous), KADAPA – 516 003  
 B.Tech IV Semester Regular Examinations, 2021  
 Disaster Preparedness & Planning Management  
 (Civil Engineering)

Time: 03:00 Hrs.

Max. Marks: 70

Note: All questions will carry equal marks

<b>Unit – 1</b>		
1	<p>Tabulate the forces in the members of the truss shown in figure. The cross sectional area and young's modulus of all the members are the same.</p> <div style="text-align: center; margin: 10px 0;"> </div>	14 M
OR		
2	<p>Determine the forces in all the members of a truss shown in Figure. Take <math>L/A</math> as constant.</p> <div style="text-align: center; margin: 10px 0;"> </div>	7 M
<b>UNIT- II</b>		
3	<p>Analyze the frame shown in the figure by Slope deflection method</p> <div style="text-align: center; margin: 10px 0;"> </div>	14M

	OR	
4	<p>Analyze the frame shown in the figure by Moment distribution method</p> 	14 M
	UNIT III	
5	<p>A system of moving loads shown in the figure below crosses from left to right a girder of 36m span simply supported at its ends. Use moving load concept to (i) Determine the maximum BM in the girder, (ii) Absolute maximum bending moment.</p> 	14 M
	OR	
6	<p>A UDL of 10kN/m, 4m long rolls over a girder of span 10m. Find the EUDL.</p>	14 M
	UNIT IV	
7	<p>A girder having a span of 18m is simply supported at its ends. The train of loads is as shown below, by taking the 50kN load is leading. Find the maximum BM which can occur (i) Under 200kN load, (ii) Under 50kN load</p> 	14 M
	OR	
8	<p>A uniformly distributed load of 50kN/m of length 15m moves over a simply supported girder of span 25m from left to right. Find the maximum</p>	14 M

	SF and BM at a section 8m from left support and also find absolute maximum bending moment.	
<b>UNIT V</b>		
9	<p>Analyse the continuous beam shown in figure below by Flexibility method and draw BMD.</p> <p>The diagram shows a continuous beam with four supports labeled A, B, C, and D. Support A is a fixed support on the left. Support B is a roller support. Support C is a roller support. Support D is a roller support on the right. The beam is divided into three spans: AB (6m), BC (5m), and CD (4m). A uniformly distributed load (UDL) of 15 kN/m is applied over the entire length of span AB. A point load of 20 kN is applied at a distance of 2.5 m from support B. A point load of 30 kN is applied at a distance of 1 m from support D. The beam is labeled with '6m, I' under span AB, '5m, 1.5I' under span BC, and '4m, 2I' under span CD.</p>	14 M
<b>OR</b>		
10	<p>Analyse the continuous beam shown in figure below by Stiffness method and draw BMD</p> <p>The diagram shows a continuous beam with four supports labeled A, B, C, and D. Support A is a fixed support on the left. Support B is a roller support. Support C is a roller support. Support D is a fixed support on the right. The beam is divided into three spans: AB (4m), BC (4m), and CD (1.5m). A point load of 150 kN is applied at a distance of 2 m from support A. A uniformly distributed load (UDL) of 50 kN/m is applied over the entire length of span BC. A point load of 100 kN is applied at a distance of 1.5 m from support C. The beam is labeled with '4m' under span AB, '4m' under span BC, and '1.5m' under span CD.</p>	14 M

K S R M College of Engineering (Autonomous), KADAPA – 516 003  
B.Tech 6<sup>th</sup> Semester Regular Examinations, 2021  
DESIGN OF REINFORCED CONCRETE STRUCTURES – 1  
(Civil Engineering)

Time: 03:00 Hrs.

Max. Marks: 70

---

Note: All questions will carry equal marks

**Unit – 1**

- 1 a Explain about the characteristic load, characteristic strength and design values & partial safety factors in Limit State Method? 7 Marks
- b What are Assumptions and limitations of Working Stress Method? 7 Marks

Or

- 2 a A simply supported RC beam of 300 mm x 500 mm overall size is reinforced with 2 number of 20 mm dia. Fe415 graded steel bars in tension zones at an effective depth of 460 mm. It carries an UDL of 12.5 kN/m including self-weight on an effective span of 5 m. Find the actual stresses in concrete and steel at mid span section. Use working Stress method? 10 Marks

Write a short note on Factored Load Method.

- b 4 Marks

**Unit – 2**

- 3 a Design a simply supported RC rectangular beam having width of 300 mm and effect span of 6 m is carrying an imposed load of 15 kN/m. Consider the grade of Steel HYSD Fe 500 and grade of concrete M25. Design the beam for moderate environment condition. (Use limit state method). 14 Marks

Or

- 4 a Design a doubly-reinforced rectangular cross-section beam for following data.  $B = 400$  mm,  $d = 800$  mm, effective cover = 50 mm,  $f_y = 415$  N/mm<sup>2</sup>,  $f_{ck} = 25$  N/mm<sup>2</sup>. (Use Limit State Method). 14 Marks

**Unit – 3**

- 5 A simply supported RC rectangular beam of 300 mm x 600 mm overall size carries a u.d.l, of 15 kN/m over an span of 6 m. It is reinforced with 4 numbers of 20 mm diameter HYSD bars in tension with a clear cover of 30 mm throughout its length. The concrete is of M25 grade. Design 14 Marks

**Subject Code: 1801604 R – 18**

the shear reinforcement in the form of vertical stirrups using 8 mm diameter mild steel bars.

Or

- 6 a Design a section of ring beam 500 mm wide and 700 mm depth subjected to a bending moment of 200 kNm, twisting moment of 15 kNm and shear force of 150 kN at ultimate. Use M20 grade of concrete, Fe 415 grade of steel? 14 Marks

**Unit – 4**

- 7 a Design a one way simply supported slab for a room having inside dimensions 3 m x 7 m. The thickness of the supporting wall is 300 mm. The slab carries 75 mm thick lime concrete on its top, unit weight of concrete is 20 kN/m<sup>3</sup>. The live load is 2 kN/m<sup>2</sup>. Use M20 mix & Fe415 grade steel. 14 Marks

Or

- 8 Design a reinforced concrete slab for a room measuring 5 m x 6 m in size. The slab is simply supported on all 4 edges with corners held down and carries a super imposed load of 3000 N/m<sup>2</sup>, inclusive of floor finishes etc. Use M20 mix & Fe415 grade steel & use IS code method. 14 Marks

**Unit – 5**

- 9 Design a reinforced concrete column 400 mm square to carry an ultimate load of 1000 kN at an eccentricity of 160 mm. Use M20 concrete & Fe415 grade steel. 14 Marks

Or

- 10 Design a circular column to carry axial load of 1000 kN. Use M20 concrete & Fe415 grade steel. 14 Marks

K S R M College of Engineering (Autonomous), KADAPA – 516 003  
B.Tech 6<sup>th</sup> Semester Regular Examinations, 2021  
FOUNDATION ENGINEERING  
(Civil Engineering)

Time: 03:00 Hrs.

Max. Marks: 70

---

Note: All questions will carry equal marks

**Unit – 1**

- 1 a Describe with a neat sketch how will you carry out the wash boring method of soil exploration. What are its merits and demerits? 7 Marks
- b Explain the terms 'inside clearance' and 'outside clearance' as applied to a sampler. Why are they provided? 7 Marks

Or

- 2 What are the various steps considered in the planning of sub-surface exploration programme? Describe the standard penetration test. In what way is it useful in foundation design? 14 Marks

**Unit – 2**

- 3 a Discuss Culmann's method for the determination of active earth pressure. 7 Marks
- b A gravity retaining wall retains 12 m of a backfill,  $\gamma = 17.7 \text{ kN/m}^3$   $\varphi = 25^\circ$  with a uniform horizontal surface. Assume the wall interface to be vertical, determine the magnitude and point of application of the total active pressure. If the water table is a height of 6 m, how far do the magnitude and the point of application of active pressure changed? 7 Marks

Or

- 4 a What are the design criteria to be satisfied for the stability of a gravity retaining wall? Indicate briefly how you will ensure the same. 7 Marks
- b A trapezoidal masonry retaining wall 1 m wide at top and 3 m wide at its bottom is 4 m high. The vertical face is retaining soil ( $\varphi = 30^\circ$ ) at a surcharge angle of  $20^\circ$  with the horizontal. Determine the maximum and minimum intensities of pressure at the base of the retaining wall. Unit weights of soil and masonry are  $20 \text{ kN/m}^3$  and  $24 \text{ kN/m}^3$  respectively. Assuming the coefficient of friction at the base of the wall as 0.45, determine the factor of safety against sliding. Also determine the factor of safety against overturning. 7 Marks

**Unit – 3**

- 5 a Describe Terzaghi's theory of bearing capacity of shallow strip foundations. Define the three bearing capacity factors and give their values for ' $\varphi = 0$ ' case. 7 Marks



- b Compute the safe bearing capacity of a continuous footing 1.5 m wide, at a depth of 1.5 m, in a soil with  $\gamma = 18 \text{ kN/m}^3$ ,  $c = 18 \text{ kN/m}^2$ , and  $\varphi = 25^\circ$ . Terzaghi's factors of  $\varphi = 25^\circ$  are  $N_c = 25$ ,  $N_q = 12.5$ , and  $N_\gamma = 10$ . What is the safe load per metre run if the factor of safety is 3? 7 Marks

Or

- 6 a What is the function of a 'foundation'? 5 Marks
- b What are the general considerations in the choice of the foundation type? 9 Marks

#### Unit – 4

- 7 a What is the basis on which the dynamic formulae are derived? Mention two well known dynamic formulae and explain the symbols involved. 5 Marks
- b A reinforced cement concrete pile weighing 30 kN (including helmet and dolly) is driven by a drop hammer weighing 30 kN with an effective fall of 0.9 m. The average penetration per blow is 15 mm. The total temporary elastic compression of the pile, pile cap and soil may be taken as 18 mm. Coefficient of restitution 0.36. What is the allowable load on the pile with a factor of safety of 2? Use Hiley's formula. 9 Marks

Or

- 8 Design of friction pile group to carry a load of 3000 kN including the weight of the pile cap at a site where the soil is uniform clay to a depth of 20m, underlain by rock. Average unconfined compressive strength of the clay is  $70 \text{ kN/m}^2$ . The clay may be assumed to be of normal sensitivity and normally loaded, with liquid limit 60%. A factor of safety of 3 is required against shear failure. Compute the settlement of the group assuming the load to be transferred at  $2/3$  length of the pile. 14 Marks

#### Unit – 5

- 9 a Write brief critical notes on 'Taylor's Stability Number'. 6 Marks
- b An embankment 10 m high is inclined at an angle of  $36^\circ$  to the horizontal. A stability analysis by the method of slices gives the following forces per running meter:  $\Sigma$  Shearing forces = 450 kN,  $\Sigma$  Normal forces = 900 kN and  $\Sigma$  Neutral forces = 216 kN. The length of the failure arc is 27 m. Laboratory tests on the soil indicate the effective values  $c'$  and  $\varphi'$  as  $20 \text{ kN/m}^2$  and  $18^\circ$  respectively. Determine the factor of safety of the slope with respect to (a) shearing strength and (b) cohesion. 8 Marks

Or

- 10 An embankment 6m high has a slope of 1V:2H. The material of slope has  $\varphi = 30^\circ$ ,  $c = 5 \text{ kN/m}^2$  and  $\gamma = 19 \text{ kN/m}^3$ . A trial slip circle has a radius of 8.8 m and its centre is at the same level as the top of the embankment. The slip circle passes through the toe. By the method of slices, find the factor of safety of the slope with respect to the slip circle. 14 Marks

K S R M College of Engineering (Autonomous), KADAPA – 516 003  
B.Tech VI Semester Regular Examinations, 2021  
**WATER RESOURCE ENGINEERING**  
(Civil Engineering)

Time: 03:00 Hrs.

Max. Marks: 70

---

Note: All questions will carry equal marks

**Unit – 1**

- 1 a Water course command an irrigated area of 1000 hectares. The intensity of irrigation of rice in this area is 70%, the transplantation of rice crop takes 15 days, and during the transplantation period the total depth of water required by a crop on field is 500mm. During the transplantation period the useful rainfall on field is 120mm. Find the duty of irrigation water for crop on field during transplantation at head of field and also head of water course. Assuming losses of water to be 20% in water course. Also calculate discharge required in water course 14 Marks

OR

- 2 a Explain the methods of application on irrigation? 7 Marks  
b Explain the factors affecting duty of water? 7 Marks

**UNIT- II**

- 3 a Design an irrigation canal to carry a discharge of 5 cumec. Assume  $N=0.0225$  and  $m=1$ . The channel slope has a bed slope of 0.2m per km? 7 Marks  
b Design an irrigation canal by Lacey's Theory? 7 Marks

OR

- 4 Explain the classification of canals? 14 Marks

**UNIT III**

- 5 a Explain the causes and failure of weirs on permissible foundation? 7 Marks  
b Draw a layout of diversion head works? 7 Marks

OR

- 6 A figure shows the section of a hydraulic structure founded on sand. Calculate the average hydraulic gradient. Also find the uplift pressure at a point 6, 12, 18, 22m from upstream side end of floor. Find the thickness of floor of these points. Take  $G=2.24$  14 Marks

**UNIT IV**

- 7 a Explain the factors governing selection of type of dam? 14 Marks

OR

- 8 a Explain different types of Reservoir? 7 Marks
- b Explain Briefly about the type of dams with Examples? 7 Marks

**UNIT V**

- 9 Explain the forces acting on a Gravity Dam? 14 Marks

OR

- 10 a Explain the criteria for safe design of earth dam? 7 Marks
- b Explain the Causes and failure of a gravity dam 7 Marks

**K S R M College of Engineering (Autonomous), KADAPA – 516 003**  
**B.Tech 6<sup>th</sup> Semester Regular Examinations, 2021**  
**PORT AND HARBOUR ENGINEERING**  
**(Civil Engineering)**

**Time: 03:00 Hrs.**

**Max. Marks: 70**

Note: All questions will carry equal marks

**Unit – 1**

- 1 a Define the following **i.** Break water **ii.** Pier **iii.** Quay and **iv.** Jetties 8 Marks
- b Distinguish between harbour and port? 6 Marks

Or

- 2 a Define **i.** Wharves **ii.** Dolphins and **iii.** Moorings 6 Marks
- b Describe briefly about Inland Water Transport system? 8 Marks

**Unit – 2**

- 3 a What are the general considerations to be taken while selecting a site for a harbour? 7 Marks
- b Explain briefly the classification of harbour? 7 Marks

Or

- 4 a What are the requirements of good harbour? 7 Marks
- b Discuss how ship Characteristics affect the harbour design? 7 Marks

**Unit – 3**

- 5 Explain the design considerations of the following; 14 Marks
- i.** Harbour Size **ii.** Turning Basin

Or

- 6 Write short notes on the following; **i.** Inland port facilities **ii.** Marinas 14 Marks

**Unit – 4**

- 7 a Explain in detail different coastal protection structures 7 Marks
- b Define dredging and how disposal of dredged materials will be carried out? 7 Marks

Or

- 8 Write briefly mechanical and hydraulic dredging in detail with neat sketches? 14 Marks

**Unit – 5**

- 9 a Explain in detail about uses of spring fenders, dolphins and docks? 7 Marks
- b Describe briefly about breakwaters and its types? 7 Marks

Or

- 10 Write briefly about different environment concern of port operations? 14 Marks

# K. S. R. M. College of Engineering – KADAPA

(AUTONOMOUS)

**B. Tech EEE, VI Semester (R-18)**

**Sub: Power Semiconductor Drives**

**Model Paper**

**Time: 3hr**

**Max. Marks: 70**

---

**Note:** Answer FIVE questions, choosing ONE question from each Unit.

All questions carry equal marks

## UNIT-I

1. a) State the essential parts of Electric drives? What are the functions of a power modulator? (8 marks)
- b) How do you define the active and passive load torques? What are the differences between the two?  
(6 marks)

**OR**

2. a) Explain the four quadrant operation of a motor driving a hoist load? (8 marks)
- b) Derive the torque expression for loads with rotational motion ? (6 marks)

## UNIT-II

3. Explain discontinuous and continuous modes of operation of single phase half controlled rectifier fed D.C separately excited motor? 14M

**OR**

4. a) Explain the two quadrant operation of D.C separately excited motor fed from controlled rectifier?  
(7 marks)
- b) Explain the braking methods employed for D.C separately excited motor? (7marks)

## UNIT – III

5. a) Explain the speed control of the Induction motor by AC Voltage Controller? (7 marks)
- b) Explain the operation of the VSI fed Induction motor drive? (7 marks)

**OR**

6. a) Explain the speed control of the Induction motor by Static Rotor Resistance Control? (8 marks)
- b) What is Slip Power Recovery, explain about Static Kramer Drive? (6 marks)

## UNIT-IV

7. a) Derive the torque expression for Synchronous motor? (7 marks)
- b) Explain the closed loop operation of VSI fed Synchronous motor drive? (7 marks)

**OR**

8. a) Explain self control of Synchronous motor by line commutated inverter? (7 marks)  
b) Explain the Brushless d.c motor drive and enumerate its applications? (7 marks)

**UNIT-V**

9. a) Explain the power factor improvement methods ? (7 marks)  
b) Explain the losses in the electrical drive system? (7marks)

**OR**

10. a) What are various methods used for maintenance of motors? (7 marks)  
b) Explain the energy conservation in electrical drives? (7 marks)



# K. S. R. M. College of Engineering – KADAPA

(AUTONOMOUS)

B. Tech EEE, VI Semester Model Question paper for Academic Year 2020-2021

## Sub: Switch Gear and Protection

Time: 3hr

Max. Marks: 70

**Note:** 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) Write a short note on insulation co-ordination.

### UNIT-II

- 3.a) Derive an expression for re-striking voltage, maximum value of re-striking Voltage and RRRV.
- b) In a 220kV system, the reactance and capacitance up to the location of circuit breaker is  $8\Omega$  and  $0.025\mu\text{F}$  respectively. A resistance of  $600\Omega$  is connected across the contacts of circuit breaker. Determine the following.
  - i. Natural frequency of oscillation.
  - ii. Damped frequency of oscillation.
  - iii. The value of resistance which will give damped frequency of oscillation, equal to  $1/4^{\text{th}}$  of natural frequency of oscillation.

**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  $90^\circ$ .

**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 have 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 generator.

#### **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?

Code: 1802607

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

**MODEL QUESTION PAPER**

**FOUR YEAR B. TECH (R18) DEGREE EXAMINATIONS, 2021**

**Sixth Semester Examination**

**Subject: Signals and Systems**

Time: 3 Hrs.

Max Marks : 70

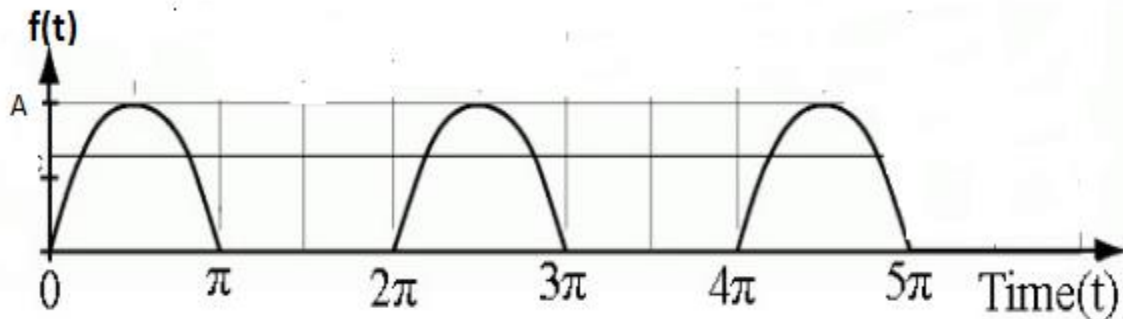
**Note :** Answer any FIVE questions by choosing one from each unit.

**UNIT-I**

1. State the classification of signals and define each. (14M)

Or

2. Obtain the Trigonometric Fourier series representation of the periodic waveform shown below. (14M)



**UNIT - II**

3. Write the existence of Fourier Transform pair. (14M)

Or

4. State and prove any four properties of Fourier transforms. (14M)

**UNIT-III**

5. Find whether the following systems are LTI systems or not. (14M)

- (i)  $y(t) = x(t^2)$  (ii)  $y(t) = x^2(t)$  (iii)  $y(t) = x(-t)$

Or

6. a) Explain the concept of Distortion less transmission of sign through LTI systems. (7M)

b) Perform the convolution of the following Signals. (7M)

(i)  $X_1(t) = e^{-3t}u(t)$  &  $X_2(t) = t u(t)$

(ii)  $X_1(t) = \cos t u(t)$  &  $X_2(t) = 2t u(t)$

**UNIT –IV**

7. Enumerate the basic operations on discrete time signals with examples. (14M)

Or

8. State and prove any four properties of DTFT. (14M)

**UNIT –V**

9. Define Laplace transforms and find the inverse Laplace Transforms of  $X(s) = \frac{4}{s(s+1)(s+2)}$  (14M)

Or

10. State and prove initial value and final value theorems for Z-Transforms. (14M)

Code: 1802607

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

**MODEL QUESTION PAPER**

**FOUR YEAR B. TECH (R18) DEGREE EXAMINATIONS, 2021**

**Sixth Semester Examination**

**Subject: Signals and Systems**

Time: 3 Hrs.

Max Marks : 70

**Note :** Answer any FIVE questions by choosing one from each unit.

**UNIT-I**

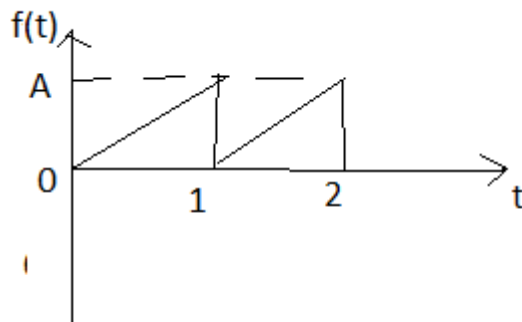
1.a) Classify the signals based on continuous and discrete terminology. (7M)

b) Enumerate the basic operations on signals with examples. (7M)

Or

2. Obtain the exponential Fourier Series representation of the periodic waveform shown below

(14M)



**UNIT - II**

3. State and prove any four properties of Fourier Transforms. (14M)

Or

4. Determine the Fourier Transforms of the signals given below. (14M)

(i)  $x(t) = \delta(t)$       (ii)  $x(t) = e^{-t} u(t)$       (iii) Unit Step function      (iv) Signum function

### UNIT-III

5. Describe the classification of systems with examples. (14M)

Or

6. Test the causality and stability of the LTI systems given below

(i)  $h(t) = e^{-6t}$  (ii)  $h(t) = e^{-4t} u(t)$  (iii)  $h(t) = t \cos t$  (iv)  $h(t) = t e^{-5t} u(t)$  (14M)

### UNIT –IV

7. State and prove Sampling theorem. (14M)

Or

8. State and prove the following properties of DTFT. (14M)

(i). Time shifting

(ii). Convolution in time

(iii) Linearity

(iv) Differentiation in frequency

### UNIT –V

9. Evaluate the Laplace transforms for the given signals (14M)

(i).  $x(t) = \sin(\omega_0 t) u(t)$

(ii).  $x(t) = e^{-3t} u(t)$

Or

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

Code: 1803601

R 18

**K.S.R.M COLLEGE OF ENGINEERING, KADAPA (AUTONOMOUS)**  
**B.Tech VI semester (R18) Regular Examinations, June 2021**

**MACHINE TOOLS**  
**(Mechanical Engineering)**  
**MODEL QUESTION PAPER**

Time:3hrs

Max Marks:70

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

**UNIT -I**

1. (a) Distinguish between orthogonal cutting and oblique cutting. 8M  
  
(b) Explain different types of chips and their favourable conditions with a neat Sketch. 6M  
(OR)
2. List out the operations performed on a Lathe and explain any four operations with a neat sketch.

**UNIT -II**

3. (a) Define cutting speed, feed and depth of cut in a shaper 6M  
(b) Explain the various parts of a Slotter with a neat Sketch 8M  
  
(OR)
4. (a) Explain the working principle of a shaper with neat sketch 4M  
(b) Explain the various parts of a double housing Planer with a neat sketch 10M

**UNIT- III**

5. Explain Jig Boring machine with a neat sketch 14M  
(OR)
6. With a neat sketch explain the radial drilling machine and its types

**UNIT- IV**

7. Name and describe the principal parts of a horizontal milling machine with a neat sketch  
(OR)
8. Explain the working mechanism of universal dividing head with a neat sketch 14M

**UNIT-V**

9. (a) With a neat sketch explain the principal parts of a Tool and Cutter Grinder 8M  
(b) How do you specify a grinding wheel and discuss 6M  
(OR)
10. (a) How are broaches classified, With a neat sketch explain the working principle of  
8M Horizontal Continuous Broaching Machine  
(b) Describe the process of lapping with a neat sketch. 6M

Code: 1803602

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

**III B.Tech II semester (R18) Regular Examinations , July 2021**

**Design of machine elements-II**

**(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

1. Design a helical tension spring for a spring loaded safety valve for the following conditions. Diameter of valve seat= 65mm, Operating pressure = 0.7MPa, Maximum pressure when the valve Blows off freely= 0.75mpa, Maximum lift of the vlve when the pressure rises from 0.7 to 0.75 MPa = 3.5mm, Maximum allowable stress= 550 MPa,  $G=84000\text{Mpa}$ , spring index=6

OR

2. A semielliptical laminated spring to carry a load of 6000 N is to consist of 7 leaves 65 mm wide two Of the leaves extending the full length of the spring. The spring is to be 1.1m in length and attached to the axle by two bolts80mm apart. The bolt holds the central portion of the spring so rigidly that they may be considered equivalent to a band having a width equal to the distance between the bolts. Assume a design stress for spring material as 350 MPa.  $P_b= 8\text{MPa}$ , Bending stress  $\sigma_b= 80\text{MPa}$ . Determine a) thickness of leaves b) Deflection of spring c) Diameter of the eye d) Length of Leaves e) Radius to a leaves should be initially bent.

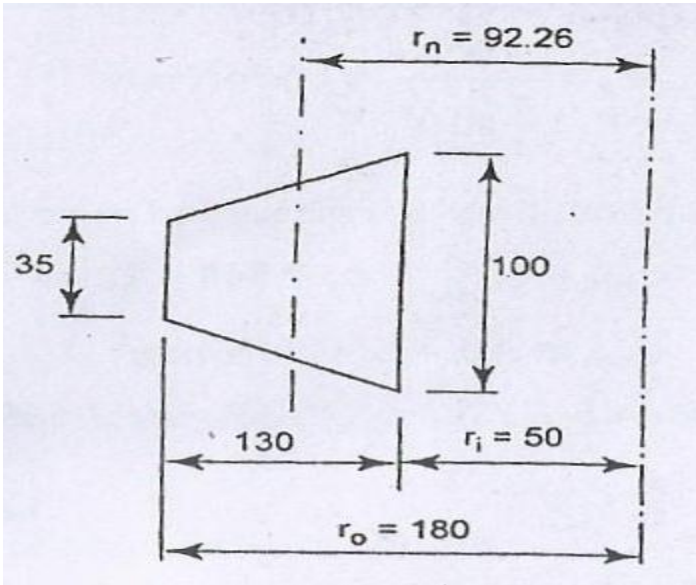
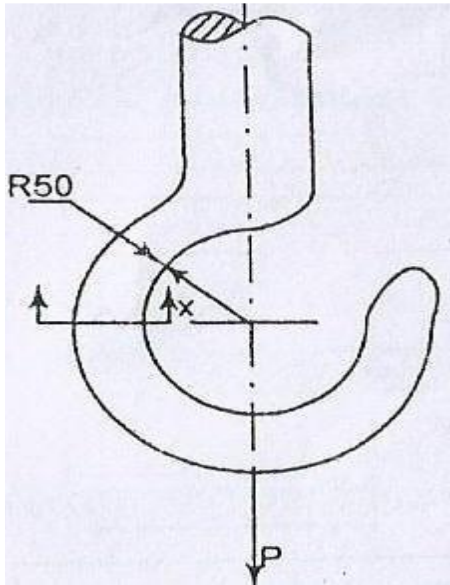
- 3.Design a journal bearing for a centrifugal pump from the following data.

Load of the journal= 20000 N Speed of the journal = 900 Rpm Type of oil is SAE 10 For which the absolute viscosity at  $55^\circ\text{c}=0.017\text{Kg/m-s}$  Ambient temperature of oil =  $15.5^\circ\text{c}$  Maximum bearing pressure for the pump =  $1.5\text{ N/mm}^2$ . Calculate also mass of the lubricating oil Required for artificial cooling if rise of temperature of oil be limited to  $10^\circ\text{c}$ . Heat dissipation coefficient =  $1232\text{W/ m}^2/^\circ\text{c}$

(OR)

4. A crane hook has a section, which for the purpose of analysis is considered trapezoidal as shown in fig. it is made of plain carbon steel with an yield strength of 350Mpa in tension. Determine the load capacity of the hook for a factor of safety3.





5. Select a suitable bearing which is to operate at 1500 rpm and is acted up on by a 8000 N radial load and 5000 N thrust load .(a)The inner ring rotates the load is steady and continuous. The safest shaft diameter from strength condition is 45 mm and the life expected is 500 hrs (b) If the Outer ring is rotating and is subjected to a lighter shock , how the life of bearing changes

OR

6. A 70mm machine shaft is to be supported at the ends. It operates continuously for 8hrs per day,320 days per year for 8 years. The load and speed cycle for one of the bearings are given below. Select the bearing.

S.No	Fraction of cycle	Radial load,N	Thrust load,N	Speed, rpm	X	Y	Z
1	0.25	3500	1000	600	0.56	1.2	1.5
2	0.25	3000	1000	800	0.56	1.2	1.5
3	0.5	4000	2000	900	0.56	1.4	1.5

7. (a) Write Classification of gears  
(b) Write the procedure for designing a helical gear .

OR

8. 7.5 kw is to be transmitted from a motor shaft rotating at 1440 rpm to another shaft with a speed reduction of 3:1 . the starting torque may be taken as 50% higher than

the mean torque. The gears should be made of heat treated steel and the shaft of mild steel. The pinion should have a minimum of 20 teeth. Design the gear drive.

- 9 Design a Cast Iron piston for a single acting four stroke engine for the following data. Cylinder bore =100 mm, Stroke=125 mm, maximum gas pressure= 5 N/mm<sup>2</sup>, Indicated mean effective pressure =0.75 N/mm<sup>2</sup>, Mechanical efficiency = 0.80, Fuel consumption = 0.15 kg per brake power per hr, High calorific value = 42000 KJ/Kg, Speed =2000 rpm. Any other data required for the design may be assumed .

OR

10. Design a connecting rod for four stroke petrol engine with the following data Piston diameter is 0.10 m, Stroke is 0.14 m ,Length of the connecting rod from centre to centre is 0.315 m, Weight of the reciprocating parts is 18.2 N, Speed is 1500 rpm with possible over speed of 2500 rpm, Compression ratio is 4:1, Probable maximum explosion pressure is 2.45 MPa.

Code: 1803603

R 18

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

**III B.Tech II semester (R18) Regular Examinations , July 2021**

**Operations research  
(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 company is manufacturing two different types of products, A and B. Each product has to be processes on two machines  $M_1$  and  $M_2$ , Product A requires 2 hours on machine  $M_1$  and 1 hour on machine  $M_2$ , product B requires 1 hour on machine  $M_1$  and 2 hours on machine  $M_2$ . The available capacity of machine  $M_1$  is 104 hours and that of machine  $M_2$  is 76 hours. Profit per unit for product A is Rs.6 and that for B is Rs.11. Calculate i) Formulate the problem ii) Find out the optimal solution by Simplex method. (14)

(Or)

2. Old hens can be bought at Rs 30 each and young ones at Rs 50 each. The old hens lay 3 eggs per week and the young ones lay 6 eggs per week, each egg being worth Rs.1.75 paise. A hen (young or old) costs Rs 3 per week to feed. he have only Rs. 100 to spend for hens. How many of each kind should he buy to give a profit of more than Rs 6 per week, assuming that he cannot house more than 20 hens? (14)

**UNIT\_II**

- 3 a) Briefly explain the Hungarian Method procedure with example. Also write the assumptions.  
b) What is degeneracy? How do you overcome degeneracy in transportation problems? (7+7)

(Or)

4. Find the optimum solution to the transportation problem given in the Table for which the cost, origin-availabilities, and destination-requirements are given. (14)

	D1	D2	D3	D4	Supply
O1	5	3	6	2	19
O2	4	7	9	1	37
O3	3	4	7	5	34
Demand	16	18	31	25	90

**UNIT\_III**

- 5.. Six jobs go first over Machine-I and then over Machine-II. The orders of completion of jobs have no significance. The following gives the machine times in hours for six jobs and the two machines.

Find the Optimal total time and the idle times of the machine. (14)

Job	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
Machine I	5	9	4	7	8	6
Machine II	7	4		3	9	5

(or)

6. A machine owner finds from his past records that the costs per year of maintaining a machine whose purchase price is Rs. 6000/- are as given below. (14)

Year	1	2	3	4	5	6	7	8
Maintenance cost	1000	1200	1400	1800	2300	2800	3400	4000
Resale price	3000	1500	750	375	200	200	200	200

Determine at what age a replacement is due.

#### UNIT-IV

7. The arrivals at a telephone booth are considered to be following Poisson law of distribution with an average time of 10 minutes between one arrival and the next Length of the phone call is assumed to be distributed exponentially with a mean of 3minutes. (14)

- What is the probability that a person arriving at the booth will have to wait?
- What is the average length of queue that forms from time to time?
- The telephone department will install a second booth when convinced that an arrival would expect to wait at least three minutes for the phone. By how much must the flow of arrivals be increased in order to justify a second booth?

(or)

8. what are the advantages and disadvantages of simulation ? Explain Montecarlo simulation? (7+7)

#### UNIT-V

9. A small firm producing automobile brake linings estimates the steel requirements for the next year's production at 6000 Kg. The cost of carrying steel in inventories works out to Rs 1 per Kg. per month. The cost of ordering works out at Rs 100 per order. If the cost per kg of steel is Rs 100, find out the economic order quantity, the number of orders per year, and total cost incurred by the firm for one year. (14)

(or)

10. Annual demand for an item is 6000 units. Ordering cost is Rs. 600 per order. Inventory carrying cost is 18% of the purchase price/unit/year. The price breakups are as shown below.

Quantity	Price (in Rs.) Per unit
$0 \leq Q_1 < 2000$	20
$2000 \leq Q_2 < 4000$	15
$4000 \leq Q_3$	9

Find the optimal order size.

(14)



Code: 1803604

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

**III B.Tech II semester (R18) Regular Examinations, JULY 2021**

**POWER PLANT ENGINEERING**

**(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. Draw a general layout of a thermal power plant and explain the different circuits?

(OR)

2. Explain the need for condensers in a steam power plant and explain the operation of a shell and tube condenser

**Unit-II**

3. Draw a neat diagram of a diesel power plant showing all systems and explain it?

(OR)

4. What different methods are used to improve the thermal efficiency of open cycle gas turbine plant?

**Unit-III**

5. Give classifications of hydroelectric power plant. Draw a line diagram giving layout of a pumped storage power plant and describe its working.

(OR)

6. Describe with the help of a neat sketch the construction and working of a Pressurized water reactor?

**Unit-IV**

7. A)What the different types of solar energy collectors  
b) Explain the working of a flat plate collector

(OR)

8. Explain the working of Horizontal axis wind turbine with neat sketch?

## Unit -V

9. a) A generating station has a maximum demand of 30MW ,a load factor of 0.6 ,aplant capacity of 0.48 and a plant use factor of 0.8 find
- I. the daily energy produced
  - II. the reserve capacity of the plant
  - III. the maximum energy that could be produced if the plant were running all the time
  - IV. the maximum energy that could be produced if the plant when running according to the operating schedule were fully loaded
10. An equipment in a power station cost Rs 15,60,000 and has a salvage value of Rs 60,000 at the end of 25 years. Determine the depreciated value of the equipment at the end of 25 years on the following methods
- I. Straight line method
  - II. Diminishing value method.

Code: 1803605

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

**B. Tech VI Semester (R18) Regular Examinations, June 2021**

**GAS TURBINES AND JET PROPULSION**

**(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.**

1. (a) List the advantages, disadvantages and applications of gas turbines over I.C. engine Plants. 5M  
  
(b) In an air standard Brayton cycle air at 1 bar,  $20^{\circ}\text{C}$  is supplied to a compressor where the pressure ratio is 4.5. The maximum temperature is  $1000^{\circ}\text{K}$ . Determine Thermal efficiency, Net work output and work ratio. 9M  

**(OR)**
2. (a) Reheating in gas turbines always improves specific work output but may not improve thermal efficiency of the plant. Discuss with a neat sketch. 5M  
  
(b) The pressure ratio of an open cycle gas turbine power plant is 5.6. Air is taken at  $30^{\circ}\text{C}$  and 1 bar. The compression is carried out in two stages with perfect inter cooling in between. The maximum temperature of the cycle is limited to  $700^{\circ}\text{C}$ . Assuming the Isentropic efficiency of each compressor stages as 85% and that of turbine as 90%, determine the power developed and efficiency of the power plant, if the air flow is  $1.2\text{Kg/s}$ . The mass of the fuel may be neglected.  $C_p=1.02\text{KJ/Kg-K}$ ,  $\gamma=1.41$ . 9M
3. (a) Explain the principle of jet propulsion and classify the gas turbine engines used for aircraft propulsion. 7M  
  
(b) What are the essential features of propulsion devices? 7M  

**(OR)**
4. (a) Derive an expression for thrust, thrust power and propulsive efficiency of jet propulsive engine. 5M  
(b) A turbo jet engine consumes air at the rate of  $60.2\text{ Kg/s}$  when flying at a speed of  $1200\text{ kmph}$ . Calculate (i) Exit velocity of the jet when enthalpy drop in the nozzle is  $200\text{ KJ/kg}$   
(ii) Fuel flow rate if A/F is 60:1 9M  
(iii) Thrust SFC  
(iv) Propulsive Power  
(v) Propulsive efficiency.
5. (a) Explain the working of a turboprop engine. 7M  
  
(b) What is meant by thrust augmentation and explain how it is affected. 7M

**(OR)**



6. The following data pertain to a turbo-jet flying at an altitude 9000 m:  
 Speed of the turbo-jet=800km/h, Propulsive efficiency=55%  
 Overall efficiency of the turbine plant=17%, Density of air at 9000m altitude =0.17kg/m<sup>3</sup>  
 Drag on the lane -6000N. Assuming calorific value of the fuels used as 47000 kJ/kg.  
 Calculate:  
 (i) Absolute velocity of the jet.  
 (ii) Volume of air compressed per min  
 (iii) Diameter of the jet  
 (iv) Power output of the unit. 14M  
 (v) Air-fuel ratio

7. Explain the working principle of ram jet engine with a neat sketch .State its advantages and disadvantages. 14M

**(OR)**

8. (a) Explain the working of pulse jet engine with a neat sketch. 7M

- (b) Mention the various advantages and disadvantages of the pulse jet engine. 7M

9. (a) Draw a neat line diagram of liquid propellant rocket system and explain its working. 8M

- (b) List out merits of liquid propellant rockets over solid propellant rockets. 6M

**(OR)**

10. (a) How the working of rocket engine is different from all types of jet engines? 7M

- (b) Explain Staging of Rockets. 7M

**KSRM COLLEGE OF ENGINEERING, KADAPA**  
**(AUTONOMOUS)**  
**B. TECH. VI SEM CE (R18)**  
**SUB: BASIC ELECTRONICS AND SENSOR TECHNOLOGY**  
**MODEL PAPER**

**TIME: 3HRS**

**Max. Marks: 70**

Note: Answer any *five* of the following  
 Choosing *one* from each unit

	<b>UNIT-I</b>	
1.(a)	Explain the operation of a unbiased PN junction diode.	7M
(b)	Describe the operation of Half wave rectifier along with input and output waveforms	7M
	(OR)	
2.(a)	Explain the working principle of Full Wave Rectifier along with input and output waveforms.	7M
(b)	Describe the working principle, operation and characteristics of Photodiode	7M
	<b>UNIT-II</b>	
3.(a)	What is transistor? Explain the operation of an NPN transistor.	7M
(b)	Draw the circuit of a BJT in CB configuration and explain the operation. Also draw input and output characteristics curves.	7M
	(OR)	
4.(a)	What is biasing, Explain transistor biasing in fixed bias mode	7M
(b)	How transistor act as a switch	7M
	<b>UNIT-III</b>	
5.(a)	Give the construction and operation details of JFET	7M
(b)	Explain drain and transfer characteristics of JFET	7M
	(OR)	
6.(a)	Compare BJT and JFET.	7M
(b)	How JFET act as an amplifier?	7M
	<b>UNIT-IV</b>	
7.(a)	Define transducer? Describe active and passive transducers with examples	7M
(b)	Describe with the help of diagram, the measurement of displacement using potentiometer. State the advantages and disadvantages of potentiometer.	7M
	(OR)	
8.(a)	Explain working principle of thermocouple. Give different types of thermocouples and their characteristics	7M
(b)	Describe the principle and operation of LVDT.	7M
	<b>UNIT-V</b>	
9.(a)	What is telescope? Explain the construction and working of astronomical telescope.	7M
(b)	Write the principle and operation of Gyroscope	7M
	(OR)	
10.(a)	Briefly explain various types of densitometers and their applications	7M
(b)	Describe capillary viscometer with the help of diagram	7M

**Code: 1804601**  
**KSRM COLLEGE OF ENGINEERING, KADAPA**  
**(AUTONOMOUS)**  
**B. TECH. VI SEM ECE (R18)**  
**SUB: Embedded Systems**  
**MODEL PAPER**

**TIME: 3HRS**

**Max. Marks: 70**

Note: Answer any *five* of the following  
Choosing *one* from each unit

<b><u>UNIT-I</u></b>		
1.(a)	Explain several common characteristics that distinguish embedded systems from other computing systems.	7M
(b)	What is a design metric? List out the common design metrics and Explain?	7M
(OR)		
2.(a)	What is a single purpose processor? What are the benefits of choosing a single purpose processor over a general purpose processor?	7M
(b)	Design a single purpose processor that computes GCD.	7M
<b><u>UNIT-II</u></b>		
3.(a)	Describe why a general purpose processor could cost less than a single purpose processor you design yourself.	7M
(b)	Compare Von-neumann and Harvard architecture.	7M
(OR)		
4.(a)	Explain the 5-stage pipelining.	4M
(b)	Explain the general software design tools that are used by embedded system designers in design, test and debug embedded software.	10M
<b><u>UNIT-III</u></b>		
5.(a)	Define the following terms: finite state machines, concurrent processes, real time systems and real time operating systems.	4M
(b)	Draw the state machine for elevator control for a new input fire using without hierarchy, with hierarchy and compare.	10M
(OR)		
6.(a)	Explain the two common methods to establish communication among processes with examples.	10M
(b)	Briefly describe real time systems.	4M
<b><u>UNIT-IV</u></b>		
7.(a)	Explain Gajski's Y-chart.	7M
(b)	Elucidate the following related to Embedded system design technology. (i) Logic synthesis (ii) RT synthesis	7M
(OR)		
8.	Explain how verification of Hardware/Software Co-simulation is done.	14M
<b><u>UNIT-V</u></b>		
9.	Explain the architecture of the kernel.	14M
(OR)		
10.(a)	Explain the terms Tasks and Task Scheduler, interrupt service routines.	7M
(b)	Explain the terms Semaphores, Mutex, Mail boxes, Message Queues	7M



Code No : 1804602

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

B. Tech VI SEMESTER(R 18)

BRANCH: ECE

MODEL PAPER

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). Give detailed review of Sampling theorem? Perform sampling for the  
signal  $m(t) = 10\cos 2\pi \cdot 16 \cdot t$ ? (7)

(b). With neat diagram explain the functioning of PCM? Discuss the advantages and disadvantages of PCM? (7)

**Or**

2. (a). Explain the functioning of delta modulation and adaptive delta modulation? (7)

(b). Explain the functioning of TDM and FDM? Give comparison between TDM and FDM? (7)

**Unit II**

3. (a) Explain the Nyquist criteria for making zero ISI ? (7)

(b) Explain Duo Binary signaling scheme? (7)

**Or**

4. (a) Explain about M-ary signaling scheme? Give comparison between Binary Vs M – ary signaling schemes (7)

(b) Give detailed description of Eye diagrams for low ISI and High ISI (7)

**Unit III**

5. (a) Explain model of band-pass data transmission systems (7)

(b) Explain Gram-Schmidt Orthogonal Procedure for Band pass data transmission (7)

**Or**

6. (a). Give the Geometric representation of digital signals (7)  
(b). Discuss coherent detection of signals in the presence of noise (7)

**Unit IV**

7. Discuss the following terms (i) Unit of information, (ii) Entropy, (iii) Rate of Information, (iv) Joint and conditional entropy (14)

**Or**

8. (a) Explain about the Channel capacity of a Gaussian channel (7)  
(b) Explain about the Bandwidth vs S/N trade-off in Information theory (7)

**Unit V**

9. (a) Explain the following terms (i) Linear block codes (ii) matrix description (iii) Hamming codes (7)  
(b) Explain about the Decoding, Binary cyclic codes (7)

**Or**

10. (a) Explain the following terms (i) Convolutional codes, (ii) Code tree diagram (7)  
(b) Explain about the (i) State diagram, (iv) Trellis diagram Encoders and Decoding algorithms (7)

**Code: 1804603**  
**KSRM COLLEGE OF ENGINEERING, KADAPA**  
**(AUTONOMOUS)**  
**B. TECH. VI SEM ECE (R18)**  
**SUB: MICROWAVE ENGINEERING**  
**MODEL PAPER**

**TIME: 3HRS**

**Max. Marks: 70**

Note: Answer any *five* of the following  
Choosing *one* from each unit

<b>UNIT-I</b>		
1.(a)	i. Identify the frequency ranges associated with microwave frequencies and hence distinguish between the different types of standard microwave band designations ii. What is a cavity resonator? Explain the principle of operation of a rectangular cavity resonator?	4M  3M
(b)	An air field rectangular wave guide of dimensions (7x3.5 cm) operates in the dominant TE <sub>10</sub> mode. a. Find the cut off frequency b. Find the phase velocity of the wave in the guide at the frequency of 3.5 GHz. c. Determine the guided wave length at the same frequency.	7M
(OR)		
2.(a)	i. Explain coupling probes and coupling loops. ii. Write a note on different types of attenuators used in microwave frequency range.	3M 4M
(b)	What is magic Tee? Describe the properties of magic Tee, giving its S-Matrix. List the basic characteristics of a circulator. Discuss any one type. Obtain its S matrix.	4M 3M
<b>UNIT-II</b>		
3.(a)	Explain the principle of operation of a two cavity klystron with a neat diagram?	7M
(b)	What are limitations of conventional tubes at microwave frequencies?	7M
(OR)		
4.(a)	Draw the schematic diagram of a reflex klystron. Explain its operation. Draw the power output and frequency characteristics of a reflex klystron and explain.	4M 3M
(b)	Derive the expression for bunching parameter of reflex klystron	7M
<b>UNIT-III</b>		
5.(a)	i. What is a slow wave structure? List the different slow wave structures. Mention their relative merits and demerits. ii. Explain how amplification takes place in a TWT.	3M 4M
(b)	Explain the need for mode separation in Magnetrons, and list out the different methods of mode separation.	7M
(OR)		
6.(a)	Explain why there are four propagation constants in TWT and derive equations to these propagation constants.	7M
(b)	Explain the $\pi$ mode operation of magnetron. How to separate it from other	7M

	modes?	
<b>UNIT-IV</b>		
7.(a)	Explain about Transferred electron devices. Describe different modes of operation of Gunn diode.	7M
(b)	What is parametric amplifier? Explain its operation in detail.	7M
(OR)		
8.(a)	Explain the physical structure, construction and operation of IMPATT diodes.	7M
(b)	Explain the construction, fabrication and encapsulation of Gunn diodes	7M
<b>UNIT-V</b>		
9.(a)	With the help of a neat sketch, briefly explain the functions of different blocks of a microwave bench.	7M
(b)	What is VSWR? Explain the method measurement for low and high VSWR?	7M
(OR)		
10.(a)	Explain measurement of microwave power using a Bolometer.	7M
(b)	i. With a schematic diagram, explain the construction of a micro strip line. ii. Mention the advantages of strip lines over other transmission lines.	4M 3M



**Code: 1804604**  
**KSRM COLLEGE OF ENGINEERING, KADAPA**  
**(AUTONOMOUS)**  
**B. TECH. VI SEM ECE (R18)**  
**SUB: FIBER OPTIC COMMUNICATION**  
**MODEL PAPER**

**TIME: 3HRS**

**Max. Marks: 70**

Note: Answer any *five* of the following  
Choosing *one* from each unit

<b><u>UNIT-I</u></b>		
1.(a)	Draw the block of optical fiber communication system and Explain about each block.	7M
(b)	The core of an optical fiber is made of glass of refractive index 1.55 and in clad with another glass of refractive index 1.48.Determine i) Numerical aperture ii) Acceptance angle iii) Critical angle	7M
(OR)		
2.(a)	Define an optical fiber. Explain in detail different types of optical fibers giving neat sketches.	7M
(b)	A graded index fiber has a core with a parabolic refractive index profile which has a diameter of 50 $\mu\text{m}$ . The fiber has a NA of 0.2.Estimate the total number of guide modes propagating in the fiber when it is operating at a wavelength $\mu\text{m}$ .	7M
<b><u>UNIT-II</u></b>		
3.(a)	What is linear scattering? Explain about Rayleigh and Mie scattering.	7M
(b)	What are the requirements for the materials to be used for optical fibers?	7M
(OR)		
4.(a)	Derive the expression for the waveguide dispersion also find the relationship between V and $\beta$ .	7M
(b)	The polarization mode dispersion in a uniformly birefringent single-mode is 300 ps/km. Calculate the maximum bit rate that may be obtained on a 20 km repeater less link assuming only polarization mode dispersion to occur.	7M
<b><u>UNIT-III</u></b>		
5.(a)	Draw the schematic of edge emitting double hetro junction LED and explain its working in detail.	7M
(b)	Derive the expression for lasing and threshold condition.	7M
(OR)		
6.(a)	Explain the principle behind the operation of an avalanche photodiode.	7M
(b)	Draw the structures for InGaAs APDs. Explain it?	7M
<b><u>UNIT-IV</u></b>		
7.(a)	Derive an expression for power coupling from a large surface emitting LED into smaller step index fiber.	7M
(b)	Discuss the various lensing schemes for coupling improvement.	7M
(OR)		
8.(a)	What is splicing? Explain about fusion splicing?	7M

(b)	Explain the concept of Connector Return Loss.	7M
<b><u>UNIT-V</u></b>		
9.(a)	Discuss about the point-to-point fiber optic link and its characteristics with an example.	7M
(b)	What are the advantages and disadvantages of using WDM in an optical fiber communication system?	7M
<b>(OR)</b>		
10.(a)	Explain the concept of EYE Pattern.	7M
(b)	Calculate the maximum bit rate that may be achieved on the fiber link length of 50 km without repeaters and using NR2 format. Transmitter rise time is 4ns. Intermodal rise time is 5ns. Intra-modal rise time 1ns.Receiver rise time is 2ns.	7M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**Model Question Paper**  
**(1805601) INTERNET OF THINGS**  
**B.Tech. VI Semester (CSE) (R18) Degree Examinations**

**Time: 3 hrs.**

**Max. Marks: 70**

Note: - Answer any **FIVE** questions choosing **ONE** question from each unit.  
All questions carry Equal marks.

**UNIT-I**

1. a) Write about IoT Protocols. 7M  
b) Explain IoT Communication Models. 7M
- (OR)**
2. Explain in detail about IoT levels and Deployment Templates. 14M

**UNIT-II**

3. a) Write about IoT applications on Home Automation and Cities domain. 7M  
b) List and explain IoT applications used for Industries and Agriculture domain. 7M
- (OR)**
4. Determine the various communication models that can be used for weather monitoring system. Explain the IoT applications used for Environment domain. 14M

**UNIT-III**

5. a) What are the differences and similarities between IoT and M2M. 7M  
b) Write about Network Function Virtualization (NFV). 7M
- (OR)**
6. Explain IoT Design Methodology in detail. 14M

**UNIT-IV**

7. a) Explain the components of Arduino uno board. 7M  
b) Explain the Arduino platform. 7M
- (OR)**
8. a) Write an arduino program to control LED using push button. 7M  
b) Write an arduino program to set the LED to a brightness specified by the value of the analogue input. 7M

**UNIT-V**

9. What is an IoT device? Explain basic building blocks of an IoT device. 14M
- (OR)**

10. Write about Raspberry Pi board and installation of Linux on Raspberry Pi.

14M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**Model Question Paper**  
**(1805602) DATA MINING**  
**B.Tech. VI Semester (CSE) (R18) Degree Examinations**

**Time: 3 hrs.**

**Max. Marks: 70**

---

Note: - Answer any **FIVE** questions choosing **ONE** question from each unit.  
All questions carry Equal marks.

**UNIT-I**

1. a) What is Data Mining? Explain the Knowledge discovery process from data. 7M  
b) What kinds of data can be mined using data mining? Explain them. 7M

**(OR)**

2. a) What kinds of patterns can be mined using data mining. 7M  
b) What are the major issues in data mining? 7M

**UNIT- II**

3. a) Why preprocess the data? Explain the reasons. 7M  
b) Describe the major tables in data preprocessing. 7M

**(OR)**

4. a) Write about data transformation techniques. 7M  
b) Write data reduction techniques. 7M

**UNIT-III**

5. Explain Apriori algorithm for finding frequent patterns with an example 14M

**(OR)**

6. Write and explain FP-Growth algorithm with suitable example. 14M

**UNIT-IV**

7. What is a Decision Tree? Explain Decision Tree induction algorithm. 14M

**(OR)**

8. Write and explain Bayesian classification with an example. 14M

**UNIT -V**

9. What is Cluster analysis? Write about Hierarchical and Density-based clustering methods. 14M

**(OR)**

10. What is outlier analysis? Write about outlier detection methods. 14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA  
Model Question Paper  
(1805603) ARTIFICIAL INTELLIGENCE (Professional Elective-2)  
B.Tech. VI Semester (CSE) (R18) Degree Examinations

Time: 3 hrs.

Max. Marks: 70

Note: - Answer any FIVE questions choosing ONE question from each unit.  
All questions carry Equal marks.

**UNIT-I**

1. a) Write short notes on BFS and DFS. 7M  
b) What is a Production system? Briefly discuss the categories of Production System. 7M

**(OR)**

2. What is Best-First Search? Explain A\* Algorithm. 14M

**UNIT-II**

3. Explain Resolution procedure with an example 14 M

**(OR)**

4. a) Write short notes on Unification Algorithm 7 M  
b) List the issues in Knowledge representation. 7 M

**UNIT-III**

5. Explain default reasoning in detail. 14M

**(OR)**

6. Explain in detail about Dempster-Shafer Theory 14M

**UNIT-IV**

7. a) Discuss about Frames 7 M  
b) Describe about Conceptual Dependency. 7 M

**(OR)**

8. Define a Script and briefly discuss about important components of a script. 14M

**UNIT-V**

9. a) What is Min-max search Procedure. 6M  
b) Explain alpha-beta cutoff in Min-max search procedure. 8M

**(OR)**

10. Describe briefly the steps in Natural Language Processing. 14M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**Model Question Paper**  
**(1805608) MOBILE APPLICATION DEVELOPMENT**  
**B.Tech. VI Semester (CSE) (R18) Degree Examinations**

**Time: 3 hrs.**

**Max. Marks: 70**

---

Note: - Answer any **FIVE** questions choosing **ONE** question from each unit.  
All questions carry Equal marks.

**UNIT-I**

- 1.a) Write a notes on android installation. 7M  
b) Explain Text view control with example. 7M

**(OR)**

2. a) Write a simple android application and using the android emulator. 7M  
b) Explain ADB and how to launching android applications on a handset. 7M

**UNIT-II**

3. a) Write a short notes an android project files. 6M  
b) Explain activity life cycle with example. 8M

**(OR)**

4. a) How to display the messages through Toast. 6M  
b) Write an android program for checkbox. 8M

**UNIT-III**

5. a) Explain about table layout with example. 7M  
b) How to creating values resources 7M

**(OR)**

6. a) Explain switching states with Toggle Buttons write one example. 7M  
b) Write an android application for playing audio. 7M

**UNIT-IV**

7. How to create an image gallery using the viewpager control.  
14M

**(OR)**

8. Write an application to add two fragments.  
14M

UNIT-V

9. a) Explain menus and their types 7M

b) How to applying s context menu to a List View. 7M

(OR)

10. a)How to creating a Drop-Down using list Action Bar. 7M

b) Explain accessing databases with the ADB. 7M



**Code: 1825601**  
**KSRM COLLEGE OF ENGINEERING, KADAPA**  
**(AUTONOMOUS)**  
**B. TECH. VI SEM EEE (R18)**  
**SUB: MANAGEMENT SCIENCE**  
**MODEL PAPER**

**TIME: 3HRS**

**Max. Marks: 70**

Note: Answer any *five* of the following  
 Choosing *one* from each unit

<b><u>UNIT-I</u></b>		
1.(a)	Evaluate F.W Taylor Scientific Management Theory.	7M
(b)	Explain the Henry Fayol's functions of management	7M
(OR)		
2.(a)	Distinguish the line & staff and functional organization.	7M
(b)	Briefly discuss about objectives and social responsibilities of management	7M
<b><u>UNIT-II</u></b>		
3.(a)	Discuss the essential steps in corporate planning through a flow chart.	7M
(b)	What do you understand by SWOT analysis? Illustrate it.	7M
(OR)		
4.(a)	What do understand by plant layout? Explain its types and evaluate the same.	7M
(b)	What are strategic alternative choices to be formulated.	7M
<b><u>UNIT-III</u></b>		
5.(a)	Explain Manpower Planning Process.	7M
(b)	Briefly discuss about methods of Merit Rating.	7M
(OR)		
6.(a)	Write short note on EOQ and ABC analysis.	7M
(b)	Explain the process of inventory control.	7M
<b><u>UNIT-IV</u></b>		
7.(a)	Define Work Study. How do you carry it out?	7M
(b)	Distinguish the methods of production.	7M
(OR)		
8.(a)	Explain how can you construct charts for the attributes.	7M
(b)	Explain Acceptance Sampling.	7M
<b><u>UNIT-V</u></b>		
9.(a)	What are the advantages of Management Information System.	7M
(b)	Explain the concept of Material Requirement Planning.	7M
(OR)		
10.(a)	Discuss about performance management.	7M
(b)	Write short note CMM and SCM.	7M

**Code: 1825609**  
**KSRM COLLEGE OF ENGINEERING, KADAPA**  
**(AUTONOMOUS)**  
**B. TECH. VI SEM CSE (R18)**  
**SUB: MANAGEMENT SCIENCE**  
**MODEL PAPER**

**TIME: 3HRS**

**Max. Marks: 70**

Note: Answer any *five* of the following  
Choosing *one* from each unit

<b><u>UNIT-I</u></b>																														
1.(a)	Evaluate F.W Taylor Scientific Management Theory.	7M																												
(b)	Explain the Henry Fayol's functions of management	7M																												
(OR)																														
2.(a)	Distinguish the line & staff and functional organization.	7M																												
(b)	Briefly discuss about objectives and social responsibilities of management	7M																												
<b><u>UNIT-II</u></b>																														
3.(a)	Discuss the essential steps in corporate planning through a flow chart.	7M																												
(b)	What do you understand by SWOT analysis? Illustrate it.	7M																												
(OR)																														
4.(a)	What do understand by plant layout? Explain its types and evaluate the same.	7M																												
(b)	What are strategic alternative choices to be formulated.	7M																												
<b><u>UNIT-III</u></b>																														
5.(a)	Explain Manpower Planning Process.	7M																												
(b)	Briefly discuss about methods of Merit Rating.	7M																												
(OR)																														
6.(a)	Write short note on EOQ and ABC analysis.	7M																												
(b)	Explain the process of inventory control.	7M																												
<b><u>UNIT-IV</u></b>																														
7.(a)	Define Work Study. How do you carry it out?	7M																												
(b)	Distinguish the methods of production.	7M																												
(OR)																														
8.(a)	Explain how can you construct charts for the attributes.	7M																												
(b)	Explain Acceptance Sampling.	7M																												
<b><u>UNIT-V</u></b>																														
9.	From the following data you are required to construct the network diagram, find the average time and determine the critical path and find out the project duration.	14M																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Activity</th> <th>1-2</th> <th>1-3</th> <th>2-4</th> <th>3-4</th> <th>4-5</th> <th>3-5</th> </tr> </thead> <tbody> <tr> <td>Optimistic time(<math>t_o</math>)</td> <td>2</td> <td>9</td> <td>5</td> <td>2</td> <td>6</td> <td>8</td> </tr> <tr> <td>Pessimistic time (<math>t_p</math>)</td> <td>5</td> <td>12</td> <td>14</td> <td>5</td> <td>6</td> <td>17</td> </tr> <tr> <td>Most likely time (<math>t_m</math>)</td> <td>14</td> <td>15</td> <td>17</td> <td>8</td> <td>12</td> <td>20</td> </tr> </tbody> </table>		Activity	1-2	1-3	2-4	3-4	4-5	3-5	Optimistic time( $t_o$ )	2	9	5	2	6	8	Pessimistic time ( $t_p$ )	5	12	14	5	6	17	Most likely time ( $t_m$ )	14	15	17	8	12	20	
Activity	1-2	1-3	2-4	3-4	4-5	3-5																								
Optimistic time( $t_o$ )	2	9	5	2	6	8																								
Pessimistic time ( $t_p$ )	5	12	14	5	6	17																								
Most likely time ( $t_m$ )	14	15	17	8	12	20																								
(OR)																														
10.(a)	PERT vs CPM	7M																												
(b)	Explain the process of Project Crashing.	7M																												