LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram-521 230 :: Krishna Dist. :: A.P
Approved by AICTE, New Delhi. Affiliated to JNTUK, Kakinada

B.Tech.(VII Semester) (R17) Supplementary Examinations, July/August 2021

TIME TABLE

TIME :10.00 AM to 01.00 PM

A.Y. 2020-21

DATE	ASE	CE	CSE	ECE	EEE	EIE	IT	ME
29-07-2021 (Thursday)	17AE24 - Mechanics of Composites	17CE28 - Estimation and Quantity Surveying	17CI18 - Big Data Analytics	17EC27 - Microwave Engineering	17EE21 - Power System Protection	17EI15 - PC Based Instrumentation	17CI18 - Big Data Analytics	17ME28 - Refrigeration and Air Conditioning
30-07-2021 (Friday)	17AE25 - Computational Fluid Dynamics	17CE29 - Remote Sensing and GIS Applications	17CI19 - Internet of Things	17EC28 - Optical Communications	17EE22 - Power Systems Operation and Control	17EI16 - PLC and SCADA	17CI19 - Internet of Things	17ME29 - Robotics
31-07-2021 (Saturday)	17AE26 - Instrumentation, Measurements and Experiments in Fluids	17CE30 - Design of Reinforced Concrete Structures - II	17CI20 - Information Security	17EC29 - Embedded System Design	17EE23 - Solid State Drives	17EI17- Analytical Instrumentation	17CI29 - Cloud Computing	17ME30 - Metrology and Instrumentation
02-08-2021 (Monday)	17AE28 - Introduction to Space Technology (PE-III)	17CE31 - Pre-stressed Concrete (PE-III)	17CI23 - Artificial Intelligence (PE-III)	17EC33 - Digital Image Processing (PE-III)	17EE24 - Intelligent Control Systems (PE-III) 17EE26 - Advanced Control Systems (PE-III)	17EI18 - Micro Electro Mechanical Systems (PE-III)	17IT07 - Android Programming (PE-III)	17ME33 - Production Planning and Control (PE-III)
03-08-2021 (Tuesday)	17AE33 - Theory of Vibrations (PE-IV)	17CE35 - Environmental Engineering (PE-IV)	17CI26 - Pattern Recognition (PE-IV)	17EC37 - DSP Processors (PE-IV)	17EE28 - Energy Conservation and Audit (PE-IV)	17EI23 - Instrumentation in Petro Chemical Industries (PE-IV)	17IT12 - Design Patterns (PE-IV)	17ME34 - Power Plant Engineering (PE-IV)
04-08-2021 (Wednesday)	17EC80 - Satellite Technology (OE-II)	17IT80 - Introduction to Database (OE-II)	17CE80 - Basic Civil Engineering (OE-II)	17IT80 - Introduction to Database (OE-II)	17CS80 - Java Programming (OE-II)	17EC80 - Satellite Technology (OE-II)	17EE81 - Utilization of Electrical Energy (OE-II)	17CE80 - Basic Civil Engineering (OE-II) 17EE81 - Utilization of Electrical Energy(OE-II) 17EI80 - Instrumentation Technology (OE-II) 17IT80 - Introduction to Database (OE-II)
05-08-2021 (Thursday)	17AE92 - Airport Design (AoC- III)	17CE92 - Environmental Sanitation (AoC- III)	17CS92 - Information Retrieval Systems(AoC- III)	17EC92 - Communication Networks(AoC- III)	17EE92 - High Voltage Engineering(AoC- III)	17EI92 - Telemetry and Telemedicine (AoC- III)	17IT92 - Bio-Informatics (AoC- III)	17ME92 - Computer Integrated Manufacturing (AoC- III)

Note: Any omissions or clashes in the time table may please be informed to the Controller of Examinations immediately.

17/07/2021

CONTROLLER OF EXAMINATIONS

PRINCIPAL 17/7/21

Date: 17-07-2021

Copy to: 1. Vice-Principal, Deans & HoDs 2. Transport in-charge & Librarian
3. Canteen, Security & Hostels 4. All Notice Boards

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R17

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.::A.P.

B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17AE92-AIRPORT DESIGN

(ASE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	What is IFR? List out the consequences if the pilot doesn't follow IFR when the visibility is poor.	6M	CO1	L1
(b)	Describe private airport in detail.	6M	CO1	L2
	(OR)			
2(a)	Explain the working of the Air Traffic Control System with a neat diagram.	6M	CO1	L2
(b)	Discuss the components of the airside with a neat diagram.	6M	CO1	L2
3(a)	Discuss ATS routes and significant points.	6M	CO2	L2
(b)	Explain the criteria based on which minimum flight altitude is set for aircraft.	6M	CO2	L2
	(OR)			
4(a)	Is it possible for ATC to change the flight plan if necessary? Justify your answer.	6M	CO2	L2
(b)	Compare Area navigation (RNAV)and Required Navigation Performance (RNP).	6M	CO2	L2
5(a)	What do you understand by transponder modes? Elucidate in detail.	6M	CO2	L1
(b)	Compare Non-radar lateral and longitudinal Separation Procedures.	6M	CO2	L2
	(OR)			
6(a)	List any five differences between PSR and SSR.	6M	CO2	L1
(b)	List down the various coordinate zones and rules of the air.	6M	CO2	L1
7(a)	Give a brief description of (i) runway visual range (*RVR*) and (ii) take-off distance available (TODA).	6M	CO3	L1
(b)	Classify the types of runways with a neat sketch.	6M	CO3	L2
	(OR)			
8(a)	Summarize the information necessary for the pilot during take-off and landing.	6M	CO3	L2
(b)	Discuss the operational procedures of domestic airports.	6M	CO3	L2
9(a)	Explain the working principle of PAPI with a neat sketch.	6M	CO3	L2
(b)	Mention the visual aids used for denoting restricted use areas. Elaborate any two aids in detail.	6M	CO3	L1
	(OR)			
10(a)	Why are signs used in airports? Mention all the signs and explain any four in detail.	6M	CO3	L1
(b)	Describe Very high-frequency Omni-directional range (VOR) aerodrome check-point marking.	6M	CO3	L2

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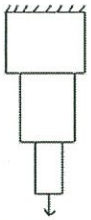
B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

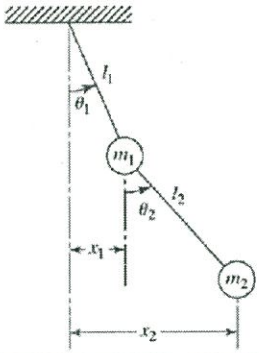
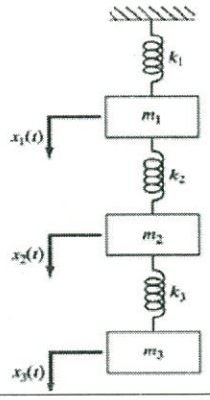
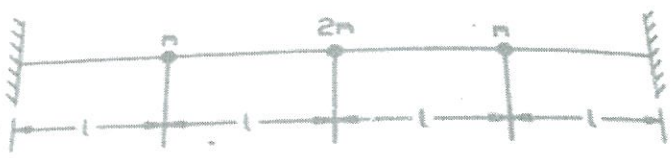
17AE33-THEORY OF VIBRATIONS

(ASE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain types of damping.	6M	CO1	L2
(b)	An unknown spring K has a natural frequency of 100 cycles per minute. When 1.2 kg mass is added to m, the natural frequency is lowed to 80 cycles per minute, determine the unknown mass m and the spring constant K in N/cm.	6M	CO1	L3
	(OR)			
2(a)	Derive the differential equation and determine the natural frequency of undamped free vibrations of spring mass system.	6M	CO1	L2
(b)	Determine the natural frequency of telescopic boom of weight 2000 N as shown in figure. $E = 2.1\times10^{11}$ N/m^2, lengths $L_1 = L_2 = L_3 = 3$ m, $A_1 = 20$ cm^2, $A_2 = 10$ cm^2, $A_3 = 5$ cm^2 	6M	CO1	L3
3(a)	Derive equation for the logarithmic decrement of free damped vibrations.	6M	CO2	L1
(b)	A mass of 1 Kg is to be supported on a spring having a stiffness of 9800 N/m. The damping coefficient is 5.9 Ns/ m. Determine the natural frequency of the system. Also calculate logarithmic decrement and the amplitude after three cycles if the initial displacement is 3mm.	6M	CO2	L3
	(OR)			
4(a)	Define critical damping and damping ratio.	6M	CO2	L1
(b)	A body of weight 5 kg is supported on spring stiffness 200 N/m and has damper connected to it produces a resistance force of 0.002N at a velocity of 1 cm/sec. What will be the ratio of initial to final vibration amplitude after 5 cycles?	6M	CO2	L3
5(a)	Define terms (i) transmissibility (ii) isolation.	6M	CO3	L1
(b)	A uniform shaft of a diameter 15 cm and length 1000 mm is mounted on two bearings. A disc of mass 25 kg is mounted on the shaft at mid span. The effective damping factor can be taken as 0.005. The eccentricity of the center of mass of the disc is 0.5 mm. Determine the steady state deflection of the shaft at the critical speed. E = 210 GPa and shaft inertia can be neglected.	6M	CO3	L3
	(OR)			
6(a)	What is meant by vibration isolation? Explain.	6M	CO3	L1

(b)	A single-cylinder engine of total mass 200 kg is mounted on an elastic support which permits vibratory movement in vertical direction only. The mass of piston is 3.5 Kg and 20 kg and a vertical reciprocating motion which may be assumed simple harmonic with a stroke of 150 mm. It is desired that the maximum vibratory force transmitted through the elastic support to the foundation shall be 600N when the engine speed is 800 rpm and less than this at all higher speeds Determine: (i) The necessary stiffness of the elastic support and the amplitude of vibration at 800 rpm (ii) If the speed is reduced to below 800 rpm at what speed will the transmitted force becomes 600 N?	6M	CO3	L3
7(a)	Explain principle modes of vibration.	6M	CO4	L2
(b)	Determinethe natural frequencies and mode shapes of double pendulum using the coordinates X_1 and X_2 and assuming small amplitudes when $m_1 = m_2 = m$ and $l_1 = l_2 = l$.  	6M	CO4	L
	(OR)			
8(a)	Explain the working of tuned mass damper.	6M	CO4	L2
(b)	Two bodies having equal masses as 60 kg each and radius of gyration 0.3 m are keyed to both ends of a shaft 0.8 m long. The shaft is 0.08 m in diameter for 0.3 m length, 0.1 m diameter for 0.2 m length and 0.09 m diameter for rest of the length.Calculate the frequency of torsional vibrations. $G = 9\times10^{11}$ N/m^2.	6M	CO4	L3
9.	Calculate the natural frequencies and mode shapes of the system shown in below figure for $k_1 = k_2 = k3 = k$, and $m_1 = m_2 = m_3 = m$ by any numerical method.  	12M	CO5	L3
	(OR)			
10.	Determine the natural frequencies and mode shapes of the system shown in figure.  	12M	CO5	L3

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L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.::A.P.

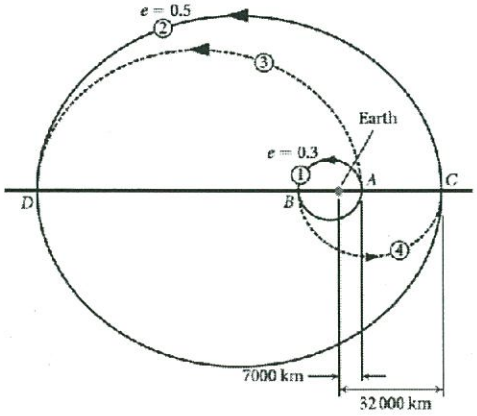
B.Tech. (VII Semester) Supplementary Examinations

17AE28-INTRODUCTION TO SPACE TECHNOLOGY

(ASE)

Time : 3 hours Max. Marks :60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain about typical features of liquid propellant feed systems.	6M	CO1	L2
(b)	Draw the schematic diagram of solid propellant motor and outline its important parts.	6M	CO1	L2
	(OR)			
2(a)	Define burnout velocity. Derive its equation and state it in terms of mass ratio.	6M	CO1	L3
(b)	Differentiate the solid propellants and liquid propellants with neat sketches.	6M	CO1	L2
3.	Two geocentric elliptical orbits have common apse lines and their perigees are on the same side of the earth. The first orbit has a perigee radius of r_p =7000 km and e =0.3, whereas for the second orbit r_p =32 000 km and e =0.5 (i) Find the minimum total delta-v and the time of flight for a transfer from the perigee of the inner orbit to the apogee of the outer orbit. (ii) Do part (i) for a transfer from the apogee of the inner orbit to the perigee of the outer orbit. 	12M	CO2	L3
	(OR)			
4(a)	Highlight the importance of alternate orbital elements.	6M	CO2	L2
(b)	Derive the equations for semi major axis and semi minor axis of elliptical orbit of a satellite.	6M	CO2	L3
5(a)	Examine about the trajectory fallowed typical sub orbital trajectory.	6M	CO3	L3
(b)	Illustrate about the trajectories followed by missiles.	6M	CO3	L3
	(OR			
6(a)	Classify the different types of rocket staging.	6M	CO3	L2
(b)	Illustrate the importance of gravity turn trajectory.	6M	CO3	L3
7.	Develop an expression for maximum deceleration achieved by steep ballistic reentry.	12M	CO3	L3
	(OR)			
8(a)	Derive the equations of lift and drag parameters of lifting body reentry.	6M	CO3	L3
(b)	Summarize about rollover reentry vehicle by using altitude graph.	6M	CO3	L2
9(a)	Develop an expression for energy dissipation in dual-spin spacecraft with neat sketch.	6M	CO4	L3
(b)	Examine the working of sensors used for attitude determination.	6M	CO4	L3
	(OR)			
10(a)	Highlight thet hree axis stabilization of spacecraft for attitude control.	6M	CO4	L2
(b)	Elucidate in brief about yo-yo de-spin mechanism in satellite attitude control.	6M	CO4	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17AE26-INSTRUMENTATION, MEASUREMENTS AND EXPERIMENTS IN FLUIDS

(ASE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Name different components of measurement systems also show a diagram of system.	6M	CO1	L1
(b)	Contrast between Wire balance and Strut-Type balance used for measurements in a Wind Tunnel.	6M	CO1	L2
	(OR)			
2(a)	Discuss about High Speed Wind Tunnel with suitable sketch giving functions of each important components.	6M	CO1	L2
(b)	A subsonic open-circuit wind tunnel runs with a test-section speed of 60 m/s. The temperature of the lab environment is 25^{0}C. If a turbulent sphere measures the turbulence factor, of the tunnel as 1.4, determine the sphere diameter. Assume the test-section pressure as the standard sea level pressure.	6M	CO1	L3
3(a)	Explain about the Hele-Shaw apparatus principles and its need for fluid flow visualization.	6M	CO2	L2
(b)	Illustrate the application of Holographic Particle Image Velocimetry method with some examples used for supersonic flow regime.	6M	CO2	L2
	(OR)			
4(a)	Differentiate between Interferometer flow visualization and Shadowgraph flow visualization technique with diagram.	6M	CO2	L4
(b)	Discuss the method which is most suitable to measure the vortex formation in wind tunnel.	6M	CO2	L2
5(a)	Discuss about limitations of Hot wire Anemometer and how it differs from vortex shedding method.	6M	CO3	L2
(b)	Breakdown the Laser Droplet Anemometer (LDA) in different parts and discuss the purpose of each components.	6M	CO3	L4
	(OR)			
6(a)	Describe the principle of Constant Current hot-wire anemometer (CCA) and give its specific applications.	6M	CO3	L2
(b)	Classify hot-wire anemometer and discuss about Fluid Jet Anemometer with sketch.	6M	CO3	L4
7(a)	List different manometer used for flow measurements. Explain inclined tube manometer and give its advantages.	6M	CO4	L1

(b)	Categorize different types of thermometers as per their applications. Which type of Thermometer is most suited for aircraft temperature monitoring?.	6M	CO4	L3
	(OR)			
8(a)	Illustrate about Pressure Transducer and low pressure measurement gauges.	6M	CO4	L3
(b)	A slender cylindrical wire of diameter 2 mm is placed in an air stream of velocity 50 m/s. If the pressure and temperature are standard sea-level values, calculate the frequency of the vortices shaded by the wire.	6M	CO4	L3
9(a)	Describe the principles of generation of signals by Data Acquisition system and its processing techniques.	6M	CO5	L2
(b)	The pressure and temperature of an air stream are measured as 450 mm of mercury and 42^{0}C, respectively. If the fluctuation in the pressure is 3 mm of mercury and error in the temperature measured is 0.2^{0}C, determine the uncertainty in the density calculated using thermal state equation.	6M	CO5	L3
	(OR)			
10(a)	Outline the multichannel analog data acquisition system with suitable sketch and its application.	6M	CO5	L4
(b)	Explain the uncertainty estimation procedure in supersonic flow regime.	6M	CO5	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17IT80-INTRODUCTION TO DATABASE
(CE,ECE&ME)

Time : 3 hours 12M Max. Marks:60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define Data, Database and DBMS. Identify the advantages of using a Database approach.	6M	CO1	L1
(b)	With a neat diagram Explain three-schema architecture.	6M	CO1	L2
	(OR)			
2(a)	Compare and contrast File system Vs Database System.	6M	CO1	L2
(b)	Identify the main characteristics of the data base approach.	6M	CO1	L1
3.	Draw a complete ER diagram with entity type, attributes, relationships for COMPANY database with entities EMPLOYEE, DEPARTMENT, DEPENDENT and PROJECT.	12M	CO2	L2
	(OR)			
4(a)	Define Entity, Attribute and Relationship. Discuss about various notations (or) symbols used in ER diagrams.	6M	CO2	L2
(b)	Write the usage of the following keys with suitable example (i) Primary key (ii) Foreign key.	6M	CO2	L1
5(a)	Define the following Relation Algebra Functions with suitable example (i) Union (ii) Intersection (iii) Cartesian Product.	6M	CO3	L1
(b)	Explain the following SQL commands with suitable example. (i) Delete (ii) Select (iii) Insert.	6M	CO3	L2
	(OR)			
6(a)	Explain the following TCL commands with suitable example. (i) Commit (ii) Rollback (iii) Save Point.	6M	CO3	L2
(b)	Illustrate the concept of views and indices with suitable examples.	6M	CO3	L3
7(a)	Define Functional Dependency and write different Functional Dependencies.	6M	CO4	L1
(b)	Define the following Inference Rule (Axioms) (i) Reflexive Rule (ii) Augmentation Rule (iii) Transitive Rule.	6M	CO4	L1
	(OR)			
8(a)	Explain Third normal form with suitable examples.	6M	CO4	L2
(b)	Summarize Multivalued Dependency and Join Dependency.	6M	CO4	L2
9.	Briefly Explain the concept of Transaction System and PropertiesofaTransaction Applications (ACID Properties).	12M	CO5	L2
	(OR)			
10(a)	Describe the concept of Deadlock Handling.	6M	CO5	L2
(b)	Write the steps invalid in Log Based Recovery.	6M	CO5	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17CE35-ENVIRONMENTAL ENGINEERING

(CE)

Time : 3 hours Max.Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Describe Primary and Secondary pollutants with examples.	6M	CO1	L1
(b)	From a stack having effective stack height of 100 m, 50 g/s of NO is emitted. The wind speed is 3 m/s at 9 m, and it is a clear summer day with the sun nearly overhead. Estimate the ground level NO concentration: (i) directly downwind at a distance of 3 km (ii) at a point downwind where NO is maximum (iii) at a point located 1 km downwind and 0.2 km off the downwind axis.	6M	CO1	L3
	(OR)			
2(a)	Explain Wind rose diagram with neat sketch.	6M	CO1	L2
(b)	Classify types of Lapse rate.	6M	CO1	L4
3(a)	List out the Ambient Air Quality standards.	6M	CO2	L1
(b)	A cyclone has an inlet width of 20 cm and the shortest length of 30 cm with diameter of 0.90 m, operates at 6 effective turns. The gas temperature is 345K and inlet velocity is 30m/s. Also, the average particle size is 12μm with particle density 1.4 g/cm3. The viscosity of air at 345K is 0.0745 kg/m-h. Determine: (i) the cut diameter,dpc ; (ii) Pressure drop at 15 o C and 1 atm (ρg = 1.2041 kg/m3).	6M	CO2	L3
	(OR)			
4(a)	Explain working principle of Electro static Precipitator with neat sketch.	6M	CO2	L2
(b)	Explain process of Combustion to remove gaseous air pollutants.	6M	CO2	L4
5(a)	Define (i) Power (ii) Intensity (iii) Decibels.	6M	CO3	L1
(b)	Determine the noise level corresponding to the addition of two noise levels of (i) 80 dB (ii) 90dB.	6M	CO3	L3
	(OR)			
6(a)	Explain about Weighting Networks in detail.	6M	CO3	L2
(b)	Classify control methods of Noise Pollution.	6M	CO3	L4
7(a)	Describe Composition of Solid waste in detail.	6M	CO4	L1
(b)	Explain disposal method of solid waste by Incineration in detail.	6M	CO4	L2
	(OR)			
8(a)	Explain concept of recycling and recovery of solid waste.	6M	CO4	L2
(b)	Classify different types of sources of Solid waste.	6M	CO4	L4
9(a)	Define (i) Environmental Impact Assessment (ii) Environmental Audit (iii) Hazardous waste.	6M	CO5	L1
(b)	Illustrate any one case study on Environmental Audit.	6M	CO5	L4
	(OR)			
10(a)	Explain concept of common effluent treatment plants in detail.	6M	CO5	L2
(b)	Classify types of E-Waste and disposal methods.	6M	CO5	L4

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17CE31-PRE-STRESSED CONCRETE

(CE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Compare prestressed concrete with reinforced concrete.	6M	CO1	L1
(b)	Differentiate between Pretensioning and Post tensioning.	6M	CO1	L2
	(OR)			
2(a)	Distinguish between linear and circumferential prestressing.	6M	CO1	L2
(b)	Distinguish between creep and shrinkage. What are the factors influencing the creep and shrinkage of concrete?	6M	CO1	L2
3.	Explain Prestressing Systems.	12M	CO1	L2
	(OR)			
4.	A prestressed concrete I beam supports a live load of 4kN/m over a simply supported span of 8m. The beam has an overall depth of 400mm. the thickness of each flange and web are 60mm and 80mm respectively. The width of each flange = 200 mm. the beam is to be prestressed by an effective prestressing force of 235kN applied at a suitable eccentricity such that the resultant stress at the bottom of beam at centre of span is zero. (i) find the eccentricity required for the prestressing force. (ii) If the tendon is eccentric, what should be the magnitude of the prestressing force the resultant stress to be zero at the bottom fibre of the central section.	12M	CO2	L2
5.	A pretensioned beam 240 × 300 mm deep is prestressed by 12 numbers HT wires each at 7 mm diameter initially stressed to 1200N/mm^2 with their centroid located 100 mm from soffit. Estimate the final loss of stress due to elastic shortening, creep of concrete, shrinkage of concrete and relaxation of HT steel on the basis of the following data. E_s = 210 kN/mm^2, E_c = 35 kN/mm^2, creep coefficient = 1.6, residual shrinkage strain = 3×10^{-4} and relaxation of steel stress = 90 N/mm^2.	12M	CO3	L3
	(OR)			
6.	A post-tensioned beam 250 × 400 mm deep is prestressed by 12 wires of 7 mm diameter initially stressed to 1200 N/mm^2. The cable profile is parabolic with zero eccentricity at supports and 120 mm at the centre. The span of the beam is 10 m. Estimate the loss of prestress due to various factors and the percentage loss for the following data. Grade of concrete M40. Es = 210 kN/mm^2; shrinkage strain = 3×10^{-4}. Relaxation of stress in steel 4%, creep coefficient = 1.6, coefficient of friction between cable and duct is 0.55. Wave effect 0.0015/m length, anchorage slip 3 mm. Take $E_c = 5700\sqrt{fck}$ in N/mm^2.	12M	CO3	L3

7(a)	What are the different types of flexural modes observed in prestressed concrete beams?	6M	CO4	L1
(b)	A pretensioned prestressed concrete beam having a an rectangular section, 150mm wide and 350 mm deep, has of prestressing steel A_p=461 mm^2, calculate the ultimate flexural strength of the section using IS 1343 code provisions.	6M	CO4	L3
	(OR)			
8.	A pretensioned T-section has a flange width of 1500 mm and thickness of flange 200 mm, width and depth of rib are 300 mm and 1200 mm respectively. The area of high tensile is 5000 mm^2 at an effective depth of 1800mm. The characteristic strength of concrete and steel are 40 N/mm^2 and 1600 N/mm^2 respectively. Calculate the flexural strength of section as per IS 1343.	12M	CO4	L3
9.	A post tensioned simply-supported beam is 20 m span. Using Fe 415 reinforcement, design the beam shear reinforcement. Using IS 1343–2012, b = 200 mm, D = 300 mm, Vu = 180 kN, f_{ck} = 40 N/mm^2, effective cover = 50 mm, compressive stress is 5 N/mm^2.	12M	CO5	L4
	(OR)			
10.	A post-tensioned concrete beam of size 400 × 800 mm deep is prestressed by an effective prestressing force of 1250 kN at an eccentricity of 120 mm. The anchor plate is 400 mm wide and 400 mm deep. Calculate the bursting force and maximum tensile stress, and design the reinforcement to resist bursting.	12M	CO5	L3

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.::A.P.

B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17CE30-DESIGN OF REINFORCED CONCRETE STRUCTURES-II

(CE)

Time : 3 hours Max.Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1.	Design a isolated square sloped footing for a column 600mm x 600mm transmitting an axial load of 1500kN.The column is reinforced with 10 bars of 20mm dia. Safe bearing capacity of soil is 150 kN/m^2. Use M_{20} and Fe_{415}.	12M	CO1	L4
	(OR)			
2.	Design an isolated footing for a column of 400mm x 550 mm transmitting a load of 1500 kN axially. The column is reinforced with 10 bars of 16 mm diameter. Take SBC of soil is 150kN/m^2.	12M	CO1	L4
3(a)	Draw and explain the arrangement of reinforcement in pile caps.	6M	CO2	L2
(b)	Explain the procedure for design of pile foundation.	6M	CO2	L2
	(OR)			
4.	A pile cap connecting 4 reinforced concrete piles of 300mm X 300mmis to be designed to support a reinforced concrete column 400mm X 400mm carrying a service load of 2000kN. The piles are located parallel to the column faces with their centers located 800mm from the center of the column. Use M30 grade concrete and Fe 500 steel.	12M	CO2	L4
5.	Design a grid slab of size 8 m X 12 m. The spacing of the ribs in mutually perpendicular directions is 1.5 m c/c. Use M20 and Fe 415 grades.	12M	CO3	L4
	(OR)			
6.	Design circular slab of diameter 5.5 m which is simply supported at the edges. Adopt service live load as 3 kN/m^2 and M20 grade concrete with Fe415 steel. Assume load factors according to IS 456:2000.	12M	CO3	L4
7.	Design a waist slab type staircase comprising a straight flight of steps supported between two stringer beams along the two sides. Assume an effective span of 1.5 m, a rise of 150 mm and a tread of 270 mm. Assume a live load of 3.0 kN/m^2. Use M-20 concrete and Fe-250 steel.	12M	CO4	L3
	(OR)			
8.	Design a dog legged staircase for an office building. The ceiling height is 3.6m. The staircase is enclosed in a room of size 2.5 m x 4 m. Use M25 concrete and Fe415 steel.	12M	CO4	L3
9.	Design a stem for T-shaped cantilever retaining wall to retain earth embankment 3 m high above ground level. The unit weight of earth is 16 kN/m^3 and its angle of repose is 30^0. The embankment is surcharged at angle of 16^0 to the horizontal. The safe bearing capacity of soil is 120 kN/m^2 and the coefficient of friction between soil and concrete as 0.4. Use M25 concrete and Fe415 steel.	12M	CO5	L4
	(OR)			
10.	Design heel slab and toe slab for the cantilever type retaining wall to retain the earth of 2.5 m height, angle of internal friction 30^0, unit weight of soil is 18 kN/m^3 safe bearing capacity of soil is 200 kN/m^2. Use M25 and Fe415 grades. Assume the embankment is surcharged at an angle of 16^0 to the horizontal.	12M	CO5	L4

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17CE29-REMOTE SENSING AND GIS APPLICATIONS
(CE)

Time : 3 hours Max.Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Illustrate with neat sketches about various types of aerial photographs.	6M	CO1	L3
(b)	Explain the relief displacement concept on height measurement.	6M	CO1	L2
	(OR)			
2(a)	Illustrate with neat sketches on stereoscopy and its importance in photogrammetry applications.	6M	CO1	L3
(b)	Describe the procedure with neat sketch of parallax measurement.	6M	CO1	L1
3(a)	Describe with neat sketches of Remote sensing process.	6M	CO2	L1
(b)	Explain any three Indian satellites characteristics.	6M	CO2	L2
	(OR)			
4(a)	Discuss about tone, texture, size and shape.	6M	CO2	L2
(b)	Explain with neat sketch energy interaction with atmosphere.	6M	CO2	L2
5(a)	Describe the various components of GIS.	6M	CO3	L1
(b)	Explain these terms spatial data input, joining data.	6M	CO3	L2
	(OR)			
6(a)	Explain with neat sketches of various types of map projections.	6M	CO3	L2
(b)	Explain about project coordinate system importance in GIS Applications.	6M	CO3	L2
7(a)	Illustrate the topology rules.	6M	CO4	L3
(b)	Explain about spatial features and data structures.	6M	CO4	L2
	(OR)			
8(a)	Illustrate these terms scanning, text data and field data.	6M	CO4	L3
(b)	Explain any two methods about integration of vector data.	6M	CO4	L2
9.	Interpret your knowledge with a case study about the Remote sensing and GIS is useful for reservoir sedimentation studies.	12M	CO5	L2
	(OR)			
10(a)	Explain about surface water mapping.	6M	CO5	L2
(b)	Describe the water quality Modeling and Mapping.	6M	CO5	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17CS92-INFORMATION RETRIEVAL SYSTEMS

(CSE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	How Information Retrieval Systems related to DBMS and Data ware houses?	6M	CO1	L1
(b)	Describe the importance of Miscellaneous Capabilities.	6M	CO1	L2
	(OR)			
2(a)	What is the importance of Concept Hierarchy in the context of searching of an item in Information Retrieval Systems?	6M	CO1	L1
(b)	Discuss the importance and Ranking and Zoning in the context of Browse Capabilities.	6M	CO1	L2
3(a)	Discuss the main features of PAT Data structures.	6M	CO2	L2
(b)	In what way Indexing Process can be done in Information Retrieval Systems?	6M	CO2	L1
	(OR)			
4(a)	Contrast the term "Successor stemming" with "Dictionary look up Stemming".	6M	CO2	L2
(b)	Differentiate the term "Document Manager" with "Document search Manager".	6M	CO2	L2
5(a)	Describe the importance of Concept Indexing.	6M	CO3	L2
(b)	How Term clustering is used In terms of Document and term clustering?	6M	CO3	L1
	(OR)			
6(a)	What are the features of Hierarchical Clustering? How Dendograms can be represented?	6M	CO3	L1
(b)	Differentiate the term "Term Frequency" with Document and Total Frequencies.	6M	CO3	L2
7(a)	Describe the features of Item Clustering.	6M	CO4	L2
(b)	What are the features of Information Visualization Technologies?	6M	CO4	L1
	(OR)			
8(a)	How the Ranking can be helpful in retrieving the text items in terms of Search Statement?	6M	CO4	L1
(b)	Discuss the process of searching the text from Hypertext.	6M	CO4	L2
9(a)	Discuss various algorithms for String Search in the context of Text Search.	6M	CO5	L2
(b)	Describe the importance of GESCAN Text Array Processor.	6M	CO5	L2
	(OR)			
10(a)	Illustrate the features of "Hardware Text Search Unit".	6M	CO5	L3
(b)	What are the measures used in Information System Evaluation?	6M	CO5	L1

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17CE80-BASIC CIVIL ENGINEERING
(CSE & ME)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Discuss the scope of the following branches of civil engineering. (*i*) structural engineering, (*ii*) transportation engineering.	6M	CO1	L2
(b)	Describe the hot and dry climatic conditions based on principles of planning.	6M	CO1	L2
	(OR)			
2(a)	Differentiate between the aspect and prospect in construction planning.	6M	CO1	L1
(b)	Explain the role of bye-laws in environmental regulation.	6M	CO1	L2
3(a)	Discuss the Chemical classification of rocks.	6M	CO2	L2
(b)	Illustrate the properties of cement.	6M	CO2	L2
	(OR)			
4(a)	Describe the structure of a tree with neat sketch.	6M	CO2	L2
(b)	Discus in detail about characteristics of good mortar.	6M	CO2	L2
5(a)	List out the essential requirements of a good foundation.	6M	CO3	L2
(b)	Describe the foundations for (i) Chimneys and cooling towers. (ii) Telecommunication towers	6M	CO3	L2
	(OR)			
6(a)	Explain the classification of soils in detail.	6M	CO3	L2
(b)	Distinguish between shallow foundation and deep foundation.	6M	CO3	L2
7(a)	Describe the characteristic features of contour lines with neat sketches.	6M	CO4	L2
(b)	Discuss in detail the uses of a contour map.	6M	CO4	L2
	(OR)			
8(a)	Compare railway transportation with road transportation and mention the advantages of railway transportation.	6M	CO4	L2
(b)	Justify the statement "Is roads are important for the development of a country".	6M	CO4	L2
9(a)	Discuss the drinking water quality standards as per BIS in a tabular form.	6M	CO5	L2
(b)	List and explain the steps involved in the planning of a water supply scheme.	6M	CO5	L2
	(OR)			
10(a)	Discuss the objectives of a water supply system.	6M	CO5	L2
(b)	Explain various sources of water used in the water supply schemes.	6M	CO5	L2

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L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17CI26-PATTERN RECOGNITION

(CSE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain the various components of a pattern recognition system with example.	6M	CO1	L2
(b)	Illustrate the relevance of Discriminant Functions by showing the derivation of Multi category case.	6M	CO1	L3
	(OR)			
2(a)	Illustrate structure of the design cycle of pattern recognition system with neat diagram.	6M	CO1	L3
(b)	What is Bayesian Decision Theory? Discuss Two Class Category Classification in detail.	6M	CO2	L1
3(a)	Explain the univariate normal density function with example.	6M	CO1	L2
(b)	Explain and derive Discriminant Functions for the Normal Density when Case 2: $\Sigma i = \Sigma$.	6M	CO1	L2
	(OR)			
4.	Demonstrate linear discriminant function for normal density with the features statistically independent with each feature having the same variance.	12M	CO1	L3
5(a)	Explain and derive both the cases of Maximum Likelihood Estimation.	6M	CO3	L2
(b)	Assume we have training data from a Gaussian distribution of known covariance Σ but unknown mean μ. Suppose further that this mean itself is random, and characterized by a Gaussian density having mean m_0 and covariance Σ_0. (i) What is the MAP estimator for μ? (ii) Suppose we transform our coordinates by a linear transform $x' = Ax$, for nonsingular matrix A, and accordingly for other terms. Determine whether your MAP estimator gives the appropriate estimate for the transformed mean μ'. Explain.	6M	CO2	L3
	(OR)			
6(a)	Explain why the maximum likelihood estimation is not working with uniformly distributed training sets.	6M	CO3	L2
(b)	Illustrate the class- conditional densities in Bayesian estimation.	6M	CO2	L3
7(a)	Explain the data description and clustering.	6M	CO4	L2
(b)	What do you mean by clustering? Explain K-means clustering algorithm with suitable example.	6M	CO4	L1
	(OR)			
8(a)	Explain the algorithm which iteratively minimizes the sum of squared error criterion while forming the clusters.	6M	CO4	L2
(b)	Differentiate between clustering and classification.	6M	CO4	L2
9(a)	Explain three basic problems of Hidden Markov models.	6M	CO5	L2
(b)	Illustrate the following in Hidden Markov model (i) Forward algorithm (ii) Backward algorithm.	6M	CO5	L3
	(OR)			
10.	Explain Hidden Markov model. How Hidden Markov model is different from traditional markov model? Explain.	12M	CO5	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17CI23-ARTIFICIAL INTELLIGENCE
(CSE)

Time : 3 hours Max. Marks : 60

Answer all questions with either or choice
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Describe about Hill Climbing in detail.	6M	CO1	L2
(b)	Discuss the Constraint satisfaction problem with example.	6M	CO1	L2
	(OR)			
2(a)	Illustrate the Depth-first Search Algorithm with example.	6M	CO1	L2
(b)	Describe about Rational Agents with example.	6M	CO1	L2
3(a)	Outline the Components of a Script with example.	6M	CO2	L3
(b)	Discuss the Conceptual Dependency with example.	6M	CO2	L3
	(OR)			
4.	Describe the Weak slot–filler structure in detail with example.	12M	CO2	L2
5(a)	Illustrate theBayesian Networks with example.	6M	CO3	L2
(b)	Discuss the fuzzy logic in detail with example.	6M	CO3	L2
	(OR)			
6(a)	Describe the Belief and Plausibility with example.	6M	CO3	L2
(b)	Summarize dempster Shafer theory in detail with example.	6M	CO3	L2
7(a)	Outline the different types planning with example.	6M	CO4	L2
(b)	Define learning agent. And describe the components of learning agent with neat sketch.	6M	CO4	L1
	(OR)			
8(a)	Describe about the Genetic learning with example.	6M	CO4	L2
(b)	Illustrate the different forms of learning with example.	6M	CO4	L2
9(a)	Discuss the working of an expert system with neat sketch.	6M	CO5	L2
(b)	Describe the Application and Working of Ant Colony System.	6M	CO5	L1
	(OR)			
10(a)	Outline the different types of Planning in Robotics.	6M	CO5	L2
(b)	Summarize the development of ant colony system.	6M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

L. B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.::A.P.

B. Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17CI20-INFORMATION SECURITY
(CSE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define Cryptanalysis. Describe various Cryptanalytic Attacks	6M	CO1	L1
(b)	Discuss Block Cipher design principles and modes of operations.	6M	CO1	L2
	(OR)			
2.	Elaborate Advanced Encryption Standard (AES) with key generation process in single round.	12M	CO1	L3
3(a)	Explain the process involved in Secure Hash Algorithms (SHA). (i) Padding of bits (ii) Appending Length (iii) Initialize Chaining Variables.	6M	CO2	L2
(b)	Compare conventional encryption and public key encryption.	6M	CO3	L2
	(OR)			
4(a)	Describe Diffie –Hellman Key exchange protocol.	6M	CO2	L1
(b)	Illustrate the overview of Message Exchange in Kerberos authentication system.	6M	CO2	L3
5(a)	Analyze the following (i) Confidentiality provided in PGP (ii) Authentication provided in PGP.	6M	CO3	L4
(b)	What is Security Association in IP Security.	6M	CO3	L1
	(OR)			
6(a)	Develop the key management process in IP Security.	6M	CO3	L3
(b)	Summarize the Operation of Pretty Good Privacy with a neat sketch.	6M	CO3	L1
7.	Demonstrate the Functionality of Secure Electronic Transactions (SET).	12M	CO4	L3
	(OR)			
8(a)	Illustrate Transport Layer Security (TLS).	6M	CO4	L4
(b)	Elaborate and explain the terms (i) PIMD (ii) OIMD (iii) POMD.	6M	CO4	L3
9(a)	Demonstrate Distributed Denial of Service (DDOS) Attacks.	6M	CO5	L3
(b)	Define Trust. Write in detail about Trusted System.	6M	CO5	L1
	(OR)			
10(a)	Describe Bell LaPadula (BLP) Model.	6M	CO5	L2
(b)	Analyze password Management System.	6M	CO5	L3

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17CI19-INTERNET OF THINGS
(CSE&IT)

Time : 3 hours Max.Marks:60

Answer one question from each unit
All questions carry equal marks.

Q.No.	Questions	Marks	CO	BL
1(a)	Explain about REST-based Communication API with its Architectural Constraints.	6M	CO1	L2
(b)	Summarize the following Transport Layer Protocols: i) Transmission Control Protocol (TCP) ii) User Datagram Protocol (UDP).	6M	CO1	L2
	(OR)			
2(a)	Write any 6 characteristics of Big Data.	6M	CO1	L2
(b)	Describe the IoT Level-3 and Level-4 development templates with neat diagrams.	6M	CO1	L2
3(a)	Elaborate the following IoT Applications: (i) Shipment Monitoring (ii) Wearable Electronics.	6M	CO2	L2
(b)	Discuss the following IoT Applications: (i) Smart Irrigation (ii) Indoor Air Quality Monitoring.	6M	CO2	L2
	(OR)			
4(a)	Paraphrase the following IoT Applications: (i) Smart Payments (ii) Noise Pollution Monitoring	6M	CO2	L2
(b)	Explain the following IoT Applications: (i) Smart Parking (ii) Smoke/Gas Detectors.	6M	CO2	L2
5(a)	Define the term 'Software Defined Networking'. Summarize various key elements of SDN.	6M	CO3	L1
(b)	Summarize the steps for IoT Device Management with NETCONF-YANG.	6M	CO3	L3
	(OR)			
6(a)	Define the term 'SNMP'. Discuss various components of SNMP.	6M	CO3	L2
(b)	With the help of a neat diagram, Explain the M2M System Architecture.	6M	CO3	L2
7(a)	Differentiate between the following IoT devices:(i) Raspberry Pi (ii) pcDuino (iii) BeagleBone Black (iv) Cubieboard.	6M	CO4	L2
(b)	Develop a Python Program for interfacing a light sensor (LDR) with Raspberry Pi.	6M	CO4	L3
	(OR)			
8(a)	Define an IoT Device. State and Explain the basic building blocks of an IoT device. Draw the block diagram of an IoT device.	6M	CO4	L2
(b)	Write about following Commands in Linux: i) cd ii) mkdir iii) cp	6M	CO4	L3
9.	Summarize the Xively Cloud for IoT (PaaS) with its basic concepts.	12M	CO5	L3
	(OR)			
10(a)	Summarize various cloud service models with examples.	6M	CO5	L2
(b)	Discuss how a model, view and template is defined in Django Framework (MVT/MTV Architecture).	6M	CO5	L2

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L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.::A.P.

B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17CI18-BIG DATA ANALYTICS

(CSE&IT)

Time : 3 hours Max.Marks : 60

Answer one question from each unit
All questions carry equal marks.

Q.No	Questions	Marks	CO	BL
1(a)	Discus some industry verticals using Big data analytics.	6M	CO1	L1
(b)	Explain Potential use cases for Big data.	6M	CO1	L2
	(OR)			
2(a)	What are the different Key Roles for a Successful Analytics Project.	6M	CO1	L1
(b)	How would you show your understanding of the tools, trends, and technology in big data?	6M	CO1	L2
3(a)	Discuss Hadoop YARN in detail with failures in classic Map-reduce.	6M	CO2	L2
(b)	Describe Map Reduce framework in detail. Draw the architectural diagram for physical organization of compute nodes.	6M	CO2	L2
	(OR)			
4(a)	What is a block and how is it formed? Explain about block replacement using Rack Awareness algorithm.	6M	CO2	L4
(b)	Explain about Java Interface for HDFS File I/O.	6M	CO2	L2
5(a)	Explain "Shuffle and Sort" phase and "Reducer Phase" in MapReduce.	6M	CO3	L2
(b)	In Map Reduce how Job Scheduling is done in case of the Fair Scheduler.	6M	CO3	L2
	(OR)			
6.	Explain Map Reduce Types and Formats.	12M	CO3	L1
7(a)	Discuss how Pig data model will help in effective data flow.	6M	CO4	L2
(b)	Explain the PIG architecture and its components.	6M	CO4	L2
	(OR)			
8(a)	How many ways to create tables in HIVE explain each one with own example?	6M	CO4	L2
(b)	Describe the various operators supported by HIVE.	6M	CO2	L2
9.	Explain the following SQL Essentials with examples. (i) Joins (ii) Set Operations (iii) Grouping Extensions.	12M	CO2	L1
	(OR)			
10(a)	What are streams? Explain stream data model with its architecture.	6M	CO2	L1
(b)	Differentiate between data stream mining and traditional data mining.	6M	CO2	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17EC29-EMBEDDED SYSTEM DESIGN
(ECE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	List and discuss the three processor technologies. What are the benefits of using each of the three different processor technologies?	6M	CO1	L2
(b)	Describe tradeoffs and design productivity gap.	6M	CO1	L2
	(OR)			
2(a)	Discuss in detail about common design metrics of an embedded system.	6M	CO1	L2
(b)	List and describe the different IC technologies of an embedded sytem.	6M	CO1	L2
3(a)	What is State machine model? Explain how to describe a system as state machine.	6M	CO2	L2
(b)	Describe the process of Capturing a state machine model in a sequential programming language.	6M	CO2	L2
	(OR)			
4(a)	What are Program-state machines (PSM)? Compare FSM and PSM.	6M	CO2	L2
(b)	Discuss the PSM description of the Elevator Controller behavior.	6M	CO2	L3
5(a)	Describe the functioning of stepper motor with an example.	6M	CO3	L2
(b)	A particular motor operates at 10 revolutions per second when its controlling input voltage is 3.7 V. Assume that you are using a microcontroller with a PWM whose output port can be set high (5 V) or low (0 V). (i) Compute the duty cycle necessary to obtain 10 revolutions per second. (ii) Provide values for a pulse width and period that achieve this duty cycle.	6M	CO3	L3
	(OR)			
6(a)	Explain the working of ADC and DAC in embedded systems.	6M	CO3	L2
(b)	Given an analog output signal whose voltage should range from 0 to 10 V, and a 8-bit digital encoding, provide the encodings for the following desired voltages: (i) 0 V, (ii) 1 V, (iii) 5.33 V, (iv) 10 V. (v) What is the resolution of our conversion?	6M	CO3	L3
7(a)	Describe a simple bus (ISA) protocol.	6M	CO4	L2
(b)	Explain the process of interfacing HM6264 and 27C256 RAM/ROM memory devices.	6M	CO4	L2
	(OR)			
8(a)	Describe the Intel 8237 DMA controller.	6M	CO4	L2
(b)	Describe the Intel 8259 priority arbiter.	6M	CO4	L2
9(a)	Compare and contrast full PLDs, ASICs, platform based designs and FPGA.	6M	CO5	L2
(b)	List the advantages and disadvantages of full custom ASICs.	6M	CO5	L2
	(OR)			
10(a)	What are the advantages of IPs? Illustrate the IP based design flow.	6M	CO5	L2
(b)	Describe briefly the co-design ladder.	6M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

B.Tech.(VII Semester) ~~Regular~~/Supplementary Examinations

17EC28-OPTICAL COMMUNICATIONS

(ECE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain the Merits and Demerits of Optical Fiber Communications.	6M	CO1	L2
(b)	Derive the Expression for Numerical Aperture of a Step Index Fiber.	6M	CO1	L3
	(OR)			
2(a)	Explain about Graded Index Fibers in Detail.	6M	CO1	L2
(b)	A silica optical fiber has a core refractive index of 1.5 and a cladding refractive index of 1.47. Estimate: (i) Critical angle at the core-cladding interface. (ii) NA for the fiber. (iii) Acceptance angle in air for the fiber.	6M	CO1	L3
3(a)	Explain about Bending Losses in Optical Fibers.	6M	CO2	L2
(b)	A 30 Km long optical fiber has an attenuation of 0.8 dB/Km at 1300nm. Find the output power if 200 Microwatts of optical power is launched into the fiber.	6M	CO2	L3
	(OR)			
4(a)	Explain about Fiber Materials.	6M	CO2	L2
(b)	Explain about Material Dispersion in Optical Fibers.	6M	CO2	L2
5(a)	Derive the expression for quantum efficiency and optical power generated internally in the LED.	6M	CO3	L3
(b)	Explain about resonant frequencies in Laser Diode.	6M	CO3	L2
	(OR)			
6(a)	Derive the Expression for Power Coupled from LED source into the Step Index Fiber.	6M	CO3	L3
(b)	Explain about Lensing Schemes for Coupling Improvement.	6M	CO3	L2
7(a)	Derive the Expression for Quantum Efficiency of PIN Photo Detector.	6M	CO4	L3
(b)	Derive the Expression for Responsivity of Avalanche Photodiodes.	6M	CO4	L3
	(OR)			
8(a)	Explain about Detector Response Time.	6M	CO4	L2
(b)	Explain about Temperature Effect on Avalanche Gain.	6M	CO4	L2
9(a)	Explain about Link Power Budget.	6M	CO5	L2
(b)	Explain about Rise Time Budget.	6M	CO5	L2
	(OR)			
10(a)	Explain the Operational Principles of WDM.	6M	CO5	L2
(b)	Explain about SONET.	6M	CO5	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17EC27-MICROWAVE ENGINEERING

(ECE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	List and discuss the applications and limitations of reflex klystron and two-cavity klystron.	6M	CO2	L1
(b)	Explain about the Bunching process in Two Cavity klystron.	6M	CO2	L2
	(OR)			
2(a)	The parameters of 2 cavity klystron are V_0=900V and I_0=30mA, frequency=8GHz, gap spacing in either cavity is 1mm, spacing between the two cavities is 4Cm, effective shunt impedance is 40K ohms. Then (i) Determine input microwave voltage in order to generate the maximum output voltage (ii) Voltage gain (iii) Efficiency of amplifier.	6M	CO2	L3
(b)	Explain the limitations of conventional tubes at microwave frequencies.	6M	CO2	L2
3(a)	What are different slow wave structures? Explain how a helical TWT achieves amplification.	6M	CO2	L2
(b)	Draw the structure of 8 cavity magnetron and explain its bunching process.	6M	CO2	L3
	(OR)			
4(a)	In TWT, the beam voltage is 3000V. The characteristic impedance is 10Ω. The operating frequency is 10 GHz and the beam current is 20mA. Determine the gain parameter and propagation constants of the four modes of the travelling waves.	6M	CO2	L3
(b)	Discuss the necessity of strapping in magnetrons.	6M	CO2	L3
5(a)	Describe the LSA mode of operation in a Gunn diode.	6M	CO1	L1
(b)	Explain the Gunn effect using the two valley theory.	6M	CO1	L3
	(OR)			
6(a)	Explain the operation of IMPATT diode with neat diagrams.	6M	CO1	L2
(b)	Discuss the differences between transferred electron devices and avalanche transit time devices.	6M	CO1	L2
7.	Explain the Bethe-hole or Single-hole Directional coupler and two hole directional coupler.	12M	CO3	L2
	(OR)			
8(a)	Explain the operation of H-plane Tee junction and derive the scattering matrix for this Tee junction with neat diagram.	6M	CO3	L4
(b)	Explain S-Matrix and its properties.	6M	CO3	L2
9(a)	Explain the principle of operation of rotary vane type attenuator.	6M	CO3	L2
(b)	Briefly explain the following: (i) Posts (ii) Tuning screws (iii) Waveguide attenuators (iv) Waveguide joints.	6M	CO3	L2
	(OR)			
10(a)	Explain about the measurement of low and high VSWR.	6M	CO4	L3
(b)	Draw a neat diagram of a microwave bench setup and explain in detail about all the components.	6M	CO4	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations
17EE92-HIGH VOLTAGE ENGINEERING
(EEE)

Time : 3 hours Max.Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain the brief review of the concepts of electric field.	6M	CO1	L2
(b)	Demonstrate how the surge voltage distributed along the transmission line when lightening stroke occurs.	6M	CO1	L3
	(OR)			
2(a)	Illustrate the expression for the growth of current due to Townsend's Primary ionization.	6M	CO1	L3
(b)	Explain the conduction and breakdown mechanism in gases.	6M	CO1	L2
3(a)	Discuss the Phenomenon of Thermal breakdown in solid dielectrics.	6M	CO1	L2
(b)	Describe the commercial liquid dielectrics. How they are different from pure liquids?	6M	CO1	L1
	(OR)			
4(a)	Explain the phenomenon of treeing and tracking in solid insulating materials.	6M	CO1	L2
(b)	Explain the different mechanisms by which break down occurs in solid dielectrics in practice.	6M	CO1	L2
5(a)	Explain the principle and operation of Van de Graff generator.	6M	CO3	L2
(b)	Explain the procedure for testing of insulators and Bushings.	6M	CO2	L2
	(OR)			
6(a)	Demonstrate the expression for ripple voltage of a multistage cockcroft-Walton circuit.	6M	CO3	L3
(b)	Explain the procedure for testing of surge arrestors.	6M	CO2	L2
7(a)	An impulse generator has eight stages with each condenser rated for 0.16μF and 125kV. The load capacitor available is 1000pF. Calculate the series resistance and the damping resistance needed to produce 1.2/50μs impulse wave. Calculate the maximum output voltage of generator, if the charging voltage is 120kV?	6M	CO3	L3
(b)	Explain the procedure to measure high A.C voltages by using series impedance voltmeter.	6M	CO3	L2
	(OR)			
8(a)	Differentiate the merits and demerits of measuring very high voltages using sphere gaps and potential dividers.	6M	CO3	L2
(b)	Explain the construction of electrostatic voltmeters.	6M	CO3	L2
9(a)	Explain the different aspects of insulation design and insulation coordination adopted for EHV systems.	6M	CO4	L2
(b)	Explain about the grounding grids and what are its applications.	6M	CO4	L2
	(OR)			
10(a)	Describe the Multipoint grounding and parallel point Grounding of high voltage equipment.	6M	CO4	L1
(b)	Explain about the counter poise wires and ground rods briefly.	6M	CO4	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17CS80-JAVA PROGRAMMING
(EEE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	List the merits and demerits of OOPS.	6M	CO1	L1
(b)	Construct a java program to find roots of quadratic equation.	6M	CO1	L3
	(OR)			
2(a)	State and explain various data types available in Java.	6M	CO1	L2
(b)	Develop a Java Program to find the factorial of the given number using recursion.	6M	CO1	L3
3(a)	How do you call sub class members in java? Write an example.	6M	CO2	L1
(b)	List and explain methods of Date class with an example.	6M	CO2	L2
	(OR)			
4(a)	Differentiate between class and interface in java with examples.	6M	CO2	L2
(b)	Demonstrate method overriding with example.	6M	CO2	L3
5(a)	Prepare a Java program using try, catch and finally blocks.	6M	CO3	L3
(b)	How do you create multiple threads? Explain with an example.	6M	CO3	L2
	(OR)			
6(a)	Write an example program using ArrayIndex out of Bounds Exception.	6M	CO3	L3
(b)	Explain about usage of throws keyword in Java with example.	6M	CO3	L2
7(a)	Describe the methods of Graphics class with example.	6M	CO4	L2
(b)	Construct java program using applet life cycle.	6M	CO4	L3
	(OR)			
8(a)	Specify the use of Adapter Class. Write a java program to handle key events using Adapter class.	6M	CO4	L2
(b)	List and explain Event Listener Interfaces in Java.	6M	CO4	L2
9(a)	Explain about AWT components hierarchy.	6M	CO5	L2
(b)	Demonstrate JTable with example.	6M	CO5	L3
	(OR)			
10(a)	State and explain about JComboBox with suitable example.	6M	CO5	L2
(b)	List the key features of Swing components.	6M	CO5	L1

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B.Tech. VII Semester ~~Regular~~/Supplementary Examinations

17EE28-ENERGY CONSERVATION AND AUDIT

(EEE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Classify different types of energy audits in detail.	6M	CO1	L2
(b)	Illustrate the various methods and steps to construct a load profile.	6M	CO1	L2
	(OR)			
2(a)	Discuss Medium-term and Long-term energy conservation schemes in detail.	6M	CO1	L2
(b)	Interpret energy saving by using smart metering.	6M	CO1	L2
3(a)	Demonstrate the Organizing procedure of energy management.	6M	CO2	L2
(b)	Enumerate on the following: (i) Controlling (ii) Promoting of energy management.	6M	CO2	L2
	(OR)			
4(a)	Discuss about the Energy Management strategy.	6M	CO2	L2
(b)	Describe the functions of Energy Manager.	6M	CO2	L1
5(a)	Analyze the effect of load on efficiency and power factor of energy efficient motors in pumping systems.	6M	CO2	L3
(b)	Write a detailed note on variable speed of energy efficient motors.	6M	CO2	L2
	(OR)			
6(a)	Explain the effect of voltage and frequency variation on electric motor performance.	6M	CO2	L2
(b)	Distinguish between energy efficient and conventional motors.	6M	CO2	L2
7(a)	Interpret the impact of non linear loads on power factor.	6M	CO3	L2
(b)	Discuss the operation of motor controllers to improve the power factor with necessary diagrams.	6M	CO3	L2
	(OR)			
8(a)	Summarize the methodology of lighting energy audit.	6M	CO3	L2
(b)	Enumerate on the following energy instruments : (i) Lux meters (ii) Tongue testers	6M	CO3	L2
9.	Illustrate the different types of Economic Evaluation Methods.	12M	CO4	L2
	(OR)			
10(a)	Analyze investment projects with the help of net present worth method.	6M	CO4	L3
(b)	List the economic aspects of Power Factor Correction.	6M	CO4	L1

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B.Tech. VII Semester ~~Regular~~/Supplementary Examinations

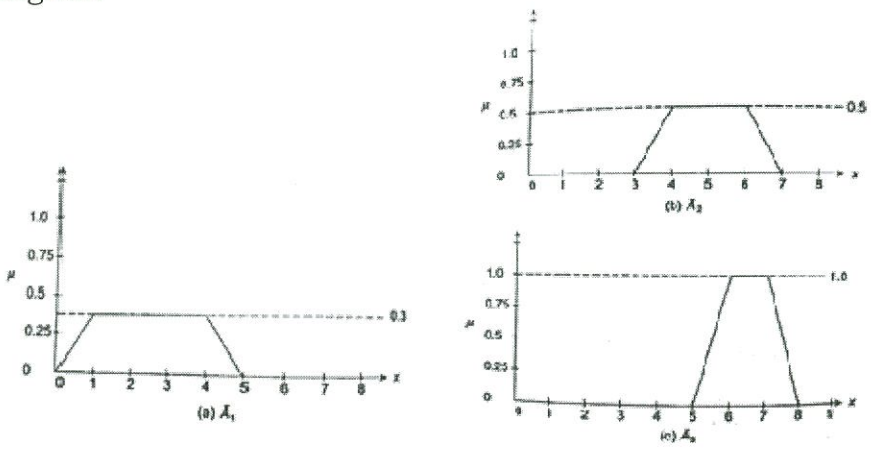
17EE24-INTELLIGENT CONTROL SYSTEMS

(EEE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Using Perceptron model train the following ANN with 2 input neurons,2 hidden neurons and 1 output neuron and use binary Activation function (with threshold 0) for the data $X=\begin{bmatrix}1\\0.5\end{bmatrix}$, d=1, η=0.3, $V=\begin{bmatrix}1 & 0.5\\0.5 & 1\end{bmatrix}$, $W=\begin{bmatrix}1\\0.5\end{bmatrix}$.	6M	CO1	L3
(b)	Illustrate Supervised, Unsupervised and Reinforcement learning strategies.	6M	CO1	L1
	(OR)			
2(a)	Solve NAND and NOR logic Gates operation using Mc-Cullouch Pitts model.	6M	CO1	L2
(b)	Explain the operation of dendrites, soma, axon in the structure of biological neuron model.	6M	CO1	L1
3(a)	Distinguish between hetero associative memory and auto associative memories with examples.	6M	CO2	L2
(b)	Describe the architecture and training algorithm of Radial Basis function networks.	6M	CO2	L2
	(OR)			
4(a)	Write down Bidirectional Associative Memory architecture and training algorithms.	6M	CO2	L2
(b)	Weights and bias of hidden and output NN layers are $\begin{bmatrix}0.50 & 0.40\\-0.20 & 0.60\end{bmatrix}$ $\begin{bmatrix}0.1\\-0.2\end{bmatrix}$ $\begin{bmatrix}0.3\\-0.8\end{bmatrix}$ $[-0.1]$ Input for neural net is (0.45, 0.91). Learning coefficient of net is 0.1. Train the net upto 2nd iteration for target 0.63 using BPNN.	6M	CO2	L3
5(a)	Consider a vector (1 -1 1 1) to be stored in a net. Test hope field net with (-1 -1 1 -1) of stored vector. Also find energy functions for stored pattern.	6M	CO2	L3
(b)	Discuss about activation and synaptic dynamics.	6M	CO2	L2
	(OR)			
6(a)	Explain about Architecture and learning of Hopfield Network with all necessary equations.	6M	CO2	L2
(b)	Discuss about how a Long Short Term Memory Network works.	6M	CO2	L2

7(a)	Demonstrate operations and properties of Classical sets.	6M	CO3	L2
(b)	Discuss about different types of fuzzy membership functions.	6M	CO3	L2
	(OR)			
8(a)	For the following fuzzy sets $A = \left\{\frac{1}{2} + \frac{0}{3} + \frac{0.5}{4} + \frac{0.2}{5}\right\}; B = \left\{\frac{0.5}{2} + \frac{0.7}{3} + \frac{0.2}{4} + \frac{0.4}{5}\right\}$ Find (i) Complement (ii) Union (iii) Intersection (iv) Difference (v) Demorgon's $\overline{A \cup B} = \overline{A} \cap \overline{B}$; $\overline{A \cap B} = \overline{A} \cup \overline{B}$.	6M	CO3	L3
(b)	Summarize the fuzzy set operations in detail with necessary diagrams.	6M	CO3	L2
9(a)	Discuss how discussion making and rules are framed in fuzzy logic control with an examples.	6M	CO4	L2
(b)	Describe the membership value assignment methods.	6M	CO3	L2
	(OR)			
10.	A1, A2 and A3 are three fuzzy sets as shown in below diagram  Determine the defuzzified output using (i) centroid method (ii) Centre of Sum (iii) Mean of Maxima for following fuzzy sets.	12M	CO4	L3

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17EE26-ADVANCED CONTROL SYSTEMS
(EEE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Obtain the state model of the system whose transfer function is $\frac{Y(S)}{U(S)} = \frac{10}{S^3+4S^2+2S+1}$	6M	CO1	L1
(b)	State and explain the properties of STM.	6M	CO1	L3
	(OR)			
2(a)	Derive the solution for homogeneous state equation.	6M	CO1	L2
(b)	A linear time-invarient system is characterised by homogeneous state equation. $\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$ Compute the solution for homogeneous equation, assume the initial state vector is $X_0 = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$	6M	CO1	L3
3(a)	Explain phase plane and phase trajectory with neat sketch.	6M	CO1	L1
(b)	For the system having the transfer function $G(s) = 1/s(s+2)$ and a relay with dead zone as nonlinear element, draw the phase plane trajectory originating from initial condition (3, 0) using Isocline method.	6M	CO1	L4
	(OR)			
4(a)	Explain the different singular points with respect to stability of nonlinear systems.	6M	CO1	L4
(b)	Sketch the phase plane trajectory of following simple linear system using analytical and Isocline method. $\begin{cases} \dot{x}_1 = x_2 \\ \dot{x}_2 = -x_2 - x_1 \end{cases}$	6M	CO1	L4
5(a)	Derive the describing function of dead zone and saturation of nonlinearity.	6M	CO2	L1
(b)	Find the curve with minimum arc length between the point x(0)=1 and the line t_1=4.	6M	CO2	L4
	(OR)			
6(a)	Derive the describing function of saturation non-linearity.	6M	CO2	L2

(b)	The response of a system is $y = ax^2 + e\ bx$. Test whether the system is linear or non linear.	6M	CO2	L4
7(a)	Consider a non linear system described by equations Investigate the $\dot{x}_1 = -3x_1-3x_2$ and $\dot{x}_2 = -x_1-x_2-x^3_2$ Stability of the equilibrium state.	6M	CO3	L3
(b)	Explain the direct method of Liapunov for the linear continuous time autonomous system.	6M	CO3	L3
	(OR)			
8(a)	State and explain the Lyapunovs instability theorem.	6M	CO3	L3
(b)	Find a Lyapunov's function for the following system $\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -1 & 1 \\ 2 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$	6M	CO3	L3
9.	Write short note on the following: (i) Optimal controller design using LQG framework (ii) Linear quadratic optimal regulator (LQR) problem formulation.	12M	CO4	L3
	(OR)			
10(a)	What is robust control? Explain in detail.	6M	CO4	L4
(b)	Explain the concept of optimal estimation and optimal control.	6M	CO4	L4

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17EE23-SOLID STATE DRIVES

(EEE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain the motoring and braking operation of three phase fully controlled rectifier control of dc separately excited motor with aid of diagrams and waveforms.	6M	CO1	L3
(b)	Summarize the advantages of three phase drives over single phase drives.	6M	CO1	L2
	(OR)			
2(a)	Draw and explain the speed torque characteristics of a DC series motor fed single phase half controlled rectifier with variation in firing angle.	6M	CO1	L2
(b)	A 220 V, 1500 rpm, 12 A separately excited dc motor has an armature resistance of 1.5 Ω. It is fed from a single phase full converter with an ac source voltage of 230 V, 50 Hz. The motor emf constant is 1.337 N-m/A. Assume continuous load current at the firing angle of 30° and torque of 5 N- m, calculate the motor speed.	6M	CO1	L2
3(a)	Draw and explain the diagram of regenerative chopper fed separately excited DC motor drive.	6M	CO2	L2
(b)	Distinguish between class A and class B choppers with suitable examples of speed control of motors.	6M	CO2	L2
	(OR)			
4(a)	Explain the operation of the two quadrant chopper fed DC drive system.	6M	CO2	L3
(b)	A220V DC series motor runs at 1200 rpm and takes an armature current of 100 A when driving a load with a constant torque. Resistances of the armature and field windings are 0.05 Ω each. DC series motor is operated under dynamic braking at twice the rated torque and 1000 rpm. Calculate the value of braking current and resistor. Assume linear magnetic circuit.	6M	CO2	L3
5(a)	Draw and explain the torque speed characteristics of induction motor through stator voltage control.	6M	CO3	L2
(b)	Draw and explain the operation of voltage source inverter fed three phase induction motor.	6M	CO3	L2
	(OR)			
6(a)	Explain how voltage and frequency are varied in voltage source inverter fed induction motor drives.	6M	CO3	L2
(b)	At 50 Hz the synchronous speed and full load speed are 1500 rpm and 370 rpm respectively. Calculate the approximate value speed for a frequency of 30 Hz and 80% of full load torque for inverter fed induction motor drive.	6M	CO3	L3
7(a)	Draw and explain the operation of a static Scherubjius drive.	6M	CO3	L3
(b)	Explain the conventional methods used for rotor resistance control of induction motor.	6M	CO3	L2
	(OR)			
8(a)	Explain the closed loop operation of static rotor resistance control of induction motor.	6M	CO3	L2
(b)	The wound rotor motor is rated at 30kw, 1160rpm, 460V, 60Hz. The open circuit voltage is 440V, and the load resistor is 0.5Ω. if the chopper frequency is 200Hz, calculate the time Ton so that the motor develops a torque of 150Nm at 1000rpm.	6M	CO3	L3
9(a)	Describe the open-loop speed control of a synchronous motor using CSI.	6M	CO3	L3
(b)	List the applications and advantages of synchronous motor drives.	6M	CO3	L1
	(OR)			
10(a)	Explain the speed control of a synchronous motor using PWM inverter.	6M	CO3	L3
(b)	A 6MW, 3-ph, 11KV,Y connected, 6 pole, 50Hz, 0.9(lead) pf synchronous motor has Xs=9ohm, Rs=0, rated field current is 50A. Machine is controlled by variable frequency control at constant V/F ratio upto the base speed and at constant V above base speed determines the armature current and power factor for half the rated motor torque, 1500rpm and rated field current.	6M	CO3	L3

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17EE21-POWER SYSTEM PROTECTION

(EEE)

Time : 3 hours Max.Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Classify various faults and discuss about the nature and causes of faults in the power system.	6M	CO1	L4
(b)	What are the requirements of a Protective Relay? Discuss each in details.	6M	CO2	L1
	(OR)			
2(a)	Summarize the zones of protection in the power system.	6M	CO1	L2
(b)	Classify various protective schemes to protect the elements of power of power systems.	6M	CO2	L4
3(a)	Describe about various components used in the static relay operation.	6M	CO1	L2
(b)	Explain about the principle of operation of attracted armature type relay with neat sketch.	6M	CO1	L2
	(OR)			
4(a)	Define the following: (i) Relay (ii) Pick-up level (iii) Under-reach (iv) Operating time (v) Over-reach.	6M	CO1	L1
(b)	Discuss about the zero crossing detectors used in the static relays.	6M	CO2	L2
5(a)	Discuss how a transformer three phase winding is protected by Mertz Price circulating scheme of protection.	6M	CO3	L2
(b)	A 3-phase, 66/ 11 kV star delta connected transformer is protected by Mertz-piece protection scheme. The CTs on the LT side have a ratio of 420/5 amps. Calculate the ratio of CTs on the HT side.	6M	CO3	L3
	(OR)			
6.	Why generators are to be protected? Explain the protection schemes for the following Faults (i) Unbalanced loading (ii) Failure of prime mover (iii) Restricted earth fault (iv) Over speed protection.	12M	CO3	L2
7(a)	Discuss in detail about the basic components of microprocessor relays.	6M	CO2	L2
(b)	Write the pseudo code for programming of microprocessor based distance relay to operate in simple manner.	6M	CO2	L1
	(OR)			
8(a)	Explain the construction and working of valve type lightning arresters. Discuss about lightning arrester ratings.	6M	CO3	L2
(b)	Write short notes of the following: (i) Causes of over voltages in a power system (ii) Switching surges (iii) Protection against over voltages.	6M	CO3	L1
9(a)	Explain about current chopping in the Circuit Breakers.	6M	CO4	L2
(b)	A circuit breaker is rated at 120 A, 30 MVA, 12.6 kV, 2.5-sec, 3-phase Oil circuit breaker. Determine the following: (i) Rated normal current, (ii) Breaking capacity (iii) Rated symmetrical breaking current, (iv) Rated making capacity (v) Short time rating (vi) Rated service voltage.	6M	CO4	L3
	(OR)			
10(a)	State and explain about the construction and working of Puffer type SF6 circuit breaker.	6M	CO4	L2
(b)	Discuss the merits and demerits of Vacuum circuit breaker and SF6 circuit breaker.	6M	CO4	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17EI92-TELEMETRY AND TELEMEDICINE

(EIE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Sketch a complete frequency telemetry scheme including the details in the transmitting and receiving sides.	6M	CO1	L1
(b)	Draw the circuit of a voltage controlled oscillator and the operation.	6M	CO2	L1
	(OR)			
2(a)	Draw a Schematic block diagram of a Telemetry system and Explain different parts in it.	6M	CO1	L1
(b)	Illustrate the Pneumatic telemetry system. What is the important parameter in the system.	6M	CO2	L3
3(a)	What is the different pulse codes used in telemetry system?	6M	CO3	L1
(b)	Explain about Pulse time modulation and Pulse Frequency modulation.	6M	CO3	L2
	(OR)			
4(a)	Illustrate the Pulse Amplitude Modulation with relevant diagrams.	6M	CO2	L3
(b)	Interpret the Pulse Code Modulation with relevant diagrams.	6M	CO3	L2
5(a)	Draw the block diagram of a telemetry scheme using frequency division multiplexing. What are the advantages of an FM.	6M	CO1	L1
(b)	Discuss the telemetry standards of baseband configuration in terms of frequency by IRIG.	6M	CO4	L2
	(OR)			
6(a)	Draw the scheme of a standard voltage controlled oscillator used for providing subcarrier frequencies.	6M	CO1	L1
(b)	Sketch a crystal varactor diode VCO circuit. What is the disadvantage compared with the circuit uses a capacitor varactor diode combination.	6M	CO2	L1
7(a)	Where are connectors used in an optical fibre communication system? What are the basic mismatch conditions that may develop associated with these connectors? Explain with the diagrams.	6M	CO4	L1
(b)	What is heterodyne fibre optical communication system and how is this technique usually applied?	6M	CO5	L1
	(OR)			
8(a)	What is dispersion? How many types are there? How dispersion affect transmission in a fibre?	6M	CO1	L1
(b)	How does energy loss occur in a fibre optical cable? What are the different types of loss mechanisms?	6M	CO2	L2
9(a)	Illustrate the block diagram of telemedicine system.	6M	CO3	L3
(b)	What are the different parameters of telemedicine system.	6M	CO3	L1
	(OR)			
10(a)	Explain digital communication system using telemedicine system.	6M	CO4	L2
(b)	Write the applications of telemedicine system.	6M	CO5	L1

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17EI18-MICRO ELECTRO MECHANICAL SYSTEMS
(EIE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Illustrate with schematic the functional relationship between different components of microsensor and microactuator in MEMS.	6M	CO1	L3
(b)	Discuss the advantages of Microsystems and Miniaturization in automotive and other industries.	6M	CO1	L2
	(OR)			
2(a)	Discuss in detailed a note on Scaling in (i) Geometry (ii) Rigid body in dynamics.	6M	CO1	L2
(b)	Discuss on consideration in MEMS design.	6M	CO1	L2
3(a)	Illustrate with neat figure the process steps involved Photolithography.	6M	CO2	L3
(b)	Write a detailed technical note on the following (i) Ion Implantation on substrate (ii) Diffusion.	6M	CO2	L2
	(OR)			
4(a)	Write a detailed technical note on the following (i) Light Sources (ii) Photoresist removal.	6M	CO2	L2
(b)	Discuss in details different chemical reaction involved in Chemical Vapor Deposition.	6M	CO2	L2
5(a)	Illustrate the anisotropic etching of cavities in (100) oriented silicon.	6M	CO3	L3
(b)	Discuss the major steps in LIGA process with suitable illustrations.	6M	CO3	L2
	(OR)			
6(a)	Explain the process steps of deep reactive ion etching.	6M	CO3	L2
(b)	Discuss in detailed associated mechanical problems in surface micromachining.	6M	CO3	L2
7(a)	Write a detailed technical note on the following (i) Substrates and wafers (ii) Polymers.	6M	CO4	L2
(b)	Explain the mechanical properties of silicon.	6M	CO4	L2
	(OR)			
8(a)	Discuss why Single-crystal silicon is the most widely used substrate material for MEMS and Microsystems.	6M	CO4	L2
(b)	Illustrated the conversion of mechanical energy to electronic signals by Piezoelectric Crystals.	6M	CO4	L3
9(a)	Explain on the working of pressure sensor.	6M	CO5	L2
(b)	Explain on the working principle of a chemical sensor.	6M	CO5	L2
	(OR)			
10(a)	Describe the working principle ofdifferent fundamental optical sensor devices with diagram.	6M	CO5	L2
(b)	Write a short note on (i) Microgears (ii) Micropumps.	6M	CO5	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17EI15-PC BASED INSTRUMENTATION
(EIE)

Time : 3 hours Max.Marks :60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	With neat block diagram, Explain in detail about General Instrumentation system.	6M	CO1	L2
(b)	What is the function of microprocessor? Explain briefly about 8086 and 80286 microprocessors	6M	CO1	L2
	(OR)			
2(a)	Illustrate the following (i) Storage devices (ii) Monitor (iii) Expansion slots.	6M	CO1	L3
(b)	Describe about PC based instrumentation system with neat block diagram and explain the function of each block.	6M	CO1	L2
3(a)	List the data acquisition configurations. Explain about GPIB data acquisition configuration.	6M	CO2	L1
(b)	Describe about functional blocks of typical PC bus based DAQ system with neat diagram.	6M	CO2	L2
	(OR)			
4(a)	What is the purpose of digital I/O function in DAQ system? Explain about surge protection circuit.	6M	CO2	L2
(b)	Illustrate the following networked data acquisition configuration techniques (i) Analog transmission (ii) Hybrid communication (iii) Digital communication.	6M	CO2	L3
5(a)	List the features of PCI bus.	6M	CO3	L1
(b)	Explain the pin configuration and signals of 8-bit ISA bus.	6M	CO3	L2
	(OR)			
6(a)	What are the issues related to the design of expansion board for ISA bus? Explain.	6M	CO3	L1
(b)	Explain about EISA bus. What are the functions and performance enhancement over ISA bus?	6M	CO3	L2
7(a)	Discuss the specifications of general purpose DAQ board.	6M	CO4	L2
(b)	Explain about timing I/O board. List the specifications of it.	6M	CO4	L2
	(OR)			
8.	Explain in detail about DAC board with necessary diagrams and programming.	12M	CO4	L2
9(a)	Explain about structure of the GPIB interface with diagram.	6M	CO5	L2
(b)	List the characteristics of RS432 serial interface standard.	6M	CO5	L1
	(OR)			
10(a)	Explain about USB system with neat diagram.	6M	CO5	L2
(b)	Illustrate about FOUNDATION field bus.	6M	CO5	L3

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17IT07-ANDROID PROGRAMMING
(IT)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Illustrate the process of launching Android applications on mobiles.	6M	CO1	L3
(b)	Define is ADB. Why it is required?	6M	CO1	L1
	(OR)			
2(a)	Explain android activity life cycle.	6M	CO1	L2
(b)	Explain in detail the role of Emulators in Mobile Application.	6M	CO1	L2
3(a)	Explain about attributes of EditText control.	6M	CO2	L2
(b)	Differentiate between ListView and GridView.	6M	CO2	L3
	(OR)			
4(a)	Explain various text assigning methods in TextView control.	6M	CO2	L3
(b)	Explain the life cycle of Android Fragments.	6M	CO2	L3
5(a)	Define android manifest.xml. Write its usages with an appropriate example.	6M	CO3	L1
(b)	List the different types of intents with example.	6M	CO3	L1
	(OR)			
6.	Develop the progress using ProgressBar in Android.	12M	CO3	L4
7(a)	Explain about SQLite transactions.	6M	CO4	L2
(b)	Define the need of shared preferences in Android.	6M	CO4	L1
	(OR)			
8(a)	List the difference between SQL and SQLite.	6M	CO4	L1
(b)	Explain the process to access shared preferences of other activities.	6M	CO4	L2
9(a)	Which system service is used to read the location data in Android?	6M	CO5	L2
(b)	List the different location provider are available that you can use to obtain lacation data.	6M	CO5	L2
	(OR)			
10.	Develop the android application to access the present location.	12M	CO5	L4

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17ME92-COMPUTER INTEGRATED MANUFACTURING

(ME)

Time : 3 hours Max. Marks: 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Classify different types of manufacturing processes.	6M	CO1	L1
(b)	Discuss the need of CIM in present Manufacturing scenario.	6M	CO1	L2
	(OR)			
2(a)	List out Benefits of CIM. Explain them briefly.	6M	CO1	L1
(b)	Discuss about Evolution of Computer Integrated Manufacturing.	6M	CO1	L2
3(a)	Describe the most important functions that are used for programming.	6M	CO2	L2
(b)	Distinguish between features of a computer numerical control that it from conventional NC.	6M	CO2	L2
	(OR)			
4(a)	Enumerate the difference between point-to-point and continuous path control in a motion control system.	6M	CO2	L1
(b)	Comparethemanual part programming and computer-assisted part programming.	6M	CO2	L2
5(a)	Mention the steps used in application of rank-order clustering.	6M	CO3	L1
(b)	Elucidate the following terms (i) Group technology (ii) production flow analysis.	6M	CO3	L2
	(OR)			
6(a)	Differentiate hierarchical structure and chain-type structure in a classification and coding scheme.	6M	CO3	L2
(b)	Elaboratethe principal applications of group technology in product design.	6M	CO3	L2
7(a)	Illustrate the components of Flexible Manufacturing System.	6M	CO4	L2
(b)	With a neat sketch, explain any two layout configurations that are found in flexible manufacturing systems.	6M	CO4	L2
	(OR)			
8(a)	Relate the differences between a flexible manufacturing cell and a flexible manufacturing system.	6M	CO4	L1
(b)	Explicatethe functions performed by human resources in an FMS.	6M	CO4	L1
9(a)	Demonstrate the variant approach type of CAPP system.	6M	CO5	L2
(b)	Name some of the benefits derived from computer-aided process planning.	6M	CO5	L1
	(OR)			
10(a)	Indicate the benefits of CAPP and explain retrieval type of CAPP.	6M	CO5	L2
(b)	Discuss some of the universal design guidelines in Design for Manufacturing and Assembly.	6M	CO5	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17EI80-INSTRUMENTATION TECHNOLOGY

(ME)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	How do classify Transducers? Describe the operation of any one electrical passive type and active type transducers with an example.	6M	CO1	L2
(b)	What are various types of standards of measurement system? Elaborate with an example.	6M	CO1	L2
	(OR)			
2.	Draw the block diagram of Generalized Measurement System and discuss each block of importance involved in Generalized Measurement System.	12M	CO1	L2
3(a)	What is Temperature Compensation of Strain Gauge? Explain the operation.	6M	CO2	L2
(b)	Select a suitable electrical passive type transducer to measure the strain and describe the operation with neat diagram.	6M	CO3	L3
	(OR)			
4(a)	Describe the operation of Half and Full Bridge Strain Gauge measurement technique with neat diagrams.	6M	CO2	L2
(b)	What is Resistive Strain Gauge? Derive the expression for Gauge factor.	6M	CO2	L2
5(a)	What are various types of Electrical Pressure sensors? Discuss any two with neat diagrams.	6M	CO2	L2
(b)	Select a suitable active type Pressure transducer and describe its operation with neat diagram. What is main drawback of active type?	6M	CO3	L3
	(OR)			
6(a)	How do classify Pressure Transducers? Describe the operation of electrical type with an example.	6M	CO2	L2
(b)	How do you measure pressure by Bourdon tube and LVDT? Elaborate the working principle and operation with neat diagram.	6M	CO2	L2
7(a)	What are various types of Electrical flow sensors? Discuss any one with neat diagram.	6M	CO2	L2
(b)	Why Orifice flow meter mostly prefer in Industry? Elaborate the working principle and operation with neat diagram.	6M	CO2	L2
	(OR)			
8(a)	Select a suitable flow meter which indicate flow rate directly. Describe its working principle and operation with neat diagram.	6M	CO3	L3
(b)	How do classify Flow Transducers? Describe the operation of any one Mechanical type with neat diagram.	6M	CO2	L2
9(a)	Select suitable temperature transducer, which measure the temperature very low Temperature and describe its working operation with neat diagrams.	6M	CO3	L3
(b)	What is RTD? Elaborate its working principle and operation with neat diagram.	6M	CO2	L2
	(OR)			
10(a)	Select suitable electrical type temperature transducer, which convert into electrical signal. Describe their working operation with neat diagrams.	6M	CO3	L3
(b)	Describe the Temperature measurement using (i) Bi-Metallic (ii) Liquid in Glass thermometer.	6M	CO2	L2

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L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17ME34-POWER PLANT ENGINEERING

(ME)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Enumerate and explain the steps involved in coal handling.	6M	CO1	L1
(b)	Classify the pulverized fuel burners and list the requirements of them.	6M	CO1	L2
	(OR)			
2(a)	Why ash and dust handling is more difficult than coal handling?	6M	CO1	L2
(b)	Explain the different components used in steam power plant.	6M	CO1	L2
3(a)	Give the layout of gas turbine power plant and explain in detail.	6M	CO2	L2
(b)	What are the various factors to be considered while selecting the site for diesel engine power plant?	6M	CO2	L1
	(OR)			
4(a)	Draw a neat line diagram of a diesel power plant showing all the systems and explain the working.	6M	CO2	L3
(b)	With neat sketches and equations explain the regeneration and reheating methods employed to improve the performance of gas turbine power plant.	6M	CO2	L2
5(a)	Discuss the various factors to be considered in selecting the site for a hydro electric power plant and discuss briefly about primary and secondary investigations.	6M	CO3	L2
(b)	Sketch and explain gas cooled reactor and also its advantages.	6M	CO3	L3
	(OR)			
6(a)	What is Hydrological cycle? Explain its significance in locating the site and design of hydro electric power plants.	6M	CO3	L2
(b)	Enumerate and explain the essential components of a nuclear reactor.	6M	CO3	L3
7(a)	With neat diagram explain the operation of solar power plant and mention the important parameters to be monitored in each block.	6M	CO4	L2
(b)	Discuss the problems associated with the operation of a fuel cell.	6M	CO4	L2
	(OR)			
8(a)	What do you understand by MHD? Explain the working principle of MHD with neat sketch.	6M	CO4	L3
(b)	With neat diagram explain the operation of wind power plant and mention the important parameters to be monitored in each block.	6M	CO4	L2
9(a)	Give a brief note on Connected load, Maximum demand and Demand factor.	6M	CO5	L1
(b)	What are the effects of SO_2, NO_2 and hydrocarbons on the human and crop lives?	6M	CO5	L2
	(OR)			
10(a)	Explain water pollution caused by thermal plants.	6M	CO5	L2
(b)	What are the various costs involved in power plant? Discuss briefly.	6M	CO5	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17ME33-PRODUCTION PLANNING AND CONTROL
(ME)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Describe the different types of production systems.	6M	CO1	L1
(b)	Explain about functions of production systems.	6M	CO1	L2
	(OR)			
2(a)	Write a short note on the following. (i) Continuous production system (ii) Intermittent production system.	6M	CO1	L2
(b)	What is job order production? Explain.	6M	CO1	L1
3(a)	Explain the general principles of forecasting techniques.	6M	CO2	L2
(b)	Using the exponential smoothing technique, Compute the forecasts from the following data (time series) under the situations when $\alpha = 0.3$. Compute the forecast for the 11^{th} period?	6M	CO2	L3
	(OR)			
4(a)	Fit the linear regression model for the following data and forecast the demand for the period 9.	6M	CO2	L4
(b)	For the given data, compute 3 month moving average	6M	CO2	L4
5(a)	Explain various costs associated with inventory.	6M	CO3	L2
(b)	Explain the inputs and outputs of the MRP system.	6M	CO3	L2
	(OR)			
6(a)	Explain the concept of Bill of materials in detail.	6M	CO3	L2
(b)	Explain P and Q systems of controlling the inventories with neat diagrams.	6M	CO3	L2
7(a)	Explain the general procedure involved in preparing route sheet.	6M	CO4	L2
(b)	Compare and contrast different scheduling policies.	6M	CO4	L4
	(OR)			
8(a)	Explain the various controlling aspects of production in detail.	6M	CO4	L2
(b)	Define route sheet. What is the information it contains? Explain it by drawing a route sheet.	6M	CO4	L2
9(a)	What is material follow up? What is the role of purchase department in material follow up?	6M	CO5	L2
(b)	Explain advantages and disadvantages of dispatching - Centralized control.	6M	CO5	L2
	(OR)			
10(a)	Write the advantages and four disadvantages of Decentralized dispatching.	6M	CO5	L2
(b)	Explain in detail the activities of dispatcher.	6M	CO5	L2

Month	1	2	3	4	5	6	7	8	9	10
Demand	28	30	32	31	27	26	30	33	32	31

Period	1	2	3	4	5	6	7	8
Demand	750	820	840	820	840	755	785	750

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct
Orders	120	90	100	175	110	50	75	130	110	90

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17ME30-METROLOGY AND INSTRUMENTATION
(ME)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain fundamental measuring processes and methods.	6M	CO1	L2
(b)	Explain graphical analysis and curve fitting.	6M	CO1	L2
	(OR)			
2(a)	Explain generalized measurement systems and its functional elements.	6M	CO1	L3
(b)	What are the performance characteristics?	6M	CO1	L1
3(a)	What are the differences between line and end standards?	6M	CO2	L3
(b)	Explain with neat sketch, the construction and uses of Vernier bevel protractor.	6M	CO2	L2
	(OR)			
4(a)	Explain the method of calibration of slip gauges.	6M	CO2	L3
(b)	Explain Tool maker's microscope and its uses.	6M	CO2	L2
5(a)	State and explain the methods of measuring primary texture of a surface.	6M	CO3	L2
(b)	State the possible causes of each of the various types of irregularities found in surface texture. Show how surfaces having the same numerical assessment may have the different properties and textures.	6M	CO3	L2
	(OR)			
6(a)	Determine and sketch the limits of tolerance and allowance for a 42 mm shaft and hole pair designated as H 8 - g10. The basic size lies in the range of30 – 50 mm. The multipliers for grades 8 and 10 are 25 and 64 respectively. The fundamental deviation for g shaft is $(-2.5D^{0.34})$ microns. The standard tolerance unit is $i = 0.45 (D)^{1/3} + 0.001D$ in microns.	6M	CO3	L3
(b)	Differentiate between unilateral and bilateral tolerance with examples.	6M	CO3	L3
7(a)	Explain with a neat sketch of Pneumatic gauge.	6M	CO4	L2
(b)	Explain with a neat sketch of Strain-Gage Rosettes.	6M	CO4	L2
	(OR)			
8(a)	What are the applications of strain measurement?	6M	CO4	L2
(b)	Explain the mechanical and electrical dynamometer.	6M	CO4	L2
9(a)	Explain the Pitot-Static Tube and Its characteristics.	6M	CO5	L2
(b)	Explain with a neat sketch of hot-wire Anemometer.	6M	CO5	L3
	(OR)			
10(a)	What are the types of thermometers in measurement of temperature?	6M	CO5	L2
(b)	Explain with a neat sketch of pyrometer.	6M	CO5	L2

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30 JUL 2021

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.::A.P.

B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17ME29-ROBOTICS

(ME)

Time : 3 hours Max.Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Elucidate with a neat sketch the rectangular and polar configurations of robot manipulator.	6M	CO1	L2
(b)	Illustrate the working of Vacuum grippers with a neat sketch.	6M	CO1	L2
	(OR)			
2(a)	Define work volume and load carrying capacity with reference to robot.	6M	CO1	L2
(b)	Discuss the applications of robots used in the field of Processing Operations.	6M	CO1	L2
3(a)	What is the purpose of apneumatic actuating system used in robot? Mention its applications.	6M	CO2	L2
(b)	Illustrate basic principle of Resolver.	6M	CO2	L2
	(OR)			
4(a)	Differentiate different actuators used in robot.	6M	CO2	L2
(b)	What sensors are used as feedback devices in a robotics?	6M	CO2	L2
5(a)	Define rotation matrix with its properties, and also explain the geometric interpretation of the rotationmatrix.	6M	CO3	L3
(b)	The coordinates of a point Q are given in a reference frame as $(2,5,6)^T$. The moving coordinate frame is obtained by translation along X-axis by 5 units followed by rotation about Y-axis by 45^0. Obtain the coordinates of P in the moving coordinate frame.	6M	CO3	L3
	(OR)			
6(a)	Obtain the DH parameters and thereby find the forward kinematic equationfor a PPP typeconfigured manipulator.	6M	CO3	L2
(b)	Find the rotation matrix corresponding to the set of Euler angles $[\pi/2 \quad \pi/4 \quad \pi/3]$. What is the direction of axis relative to the base frame?	6M	CO3	L3
7(a)	State reasons for preferring Inverse kinematic solution over a direct kinematic solution and specify the conditions under which no solution, atleast one solution and multiple inverse kinematic solutions are possible.	6M	CO4	L3
(b)	Determine the singularities of a wrist of a manipulator.	6M	CO4	L2
	(OR)			
8.	A planar manipulator arm with RR type of configuration is used to move the end-effector in a straight line. Compute the Jacobian and also obtain the joint velocities to move the end-effector in a straight line. Assume the link lengths to be to be 1m and 0.5 m respectively.	12M	CO4	L3
9(a)	A two-degree freedom planar robot is to follow a straight line between the start (3,10) in cmand end at (8, 15) in cm points of the motion segment. Find the joint variable for the robot if the path is divided into 5 segments. Assume each link to be 10 cm long.	6M	CO5	L3
(b)	Enumerate the applications of joint space and Cartesian space trajectory planning of robots.	6M	CO5	L2
	(OR)			
10(a)	Define Trajectory planning. Discuss the steps involved in trajectory planning.	6M	CO5	L1
(b)	Differentiate point to point motion and continuous path motion.	6M	CO5	L2

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H.T.No.										

29 JUL 2021

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

17ME28-REFRIGERATION AND AIR CONDITIONING

(ME)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Derive an expression for the COP of Bell Coleman cycle with the help of P-V and T-S diagram.	6M	CO1	L1
(b)	In a refrigeration plant working on Bell Coleman cycle, air is compressed to 5 bar from 1 bar. Its initial temperature is 10 ^{0}C. After compression, the air is cooled up to 20 ^{0}C in a cooler before expanding back to a pressure of 1 bar. Determine the theoretical COP of the plant and net refrigeration effect.	6M	CO2	L2
	(OR)			
2(a)	List out the desirable properties of a good refrigerant.	6M	CO3	L2
(b)	A machine working on a Carnot cycle operates between 305 K and 260 K. Determine the COP, when it is operated as (i) Refrigerator (ii) Heat pump (iii) Efficiency, if it is acting as Heat engine.	6M	CO2	L2
3(a)	What are the factors affecting the performance of vapour compression refrigeration system and explain in detail?	6M	CO1	L3
(b)	An ammonia plant produces 25 tonnes of ice from water at 0 ^{0}C in 24 hours. The condensing and suction temperatures are 20 ^{0}C and -10 ^{0}C respectively. The vapour is dry and saturated at the end of compression. If the COP of the plant is 75% of the theoretical COP, estimate the power required to drive the compressor and the mass flow rate of refrigerant. Latent heat of ice is 336 kJ/kg.	6M	CO2	L3

Temperature	Enthalpy, kJ/kg		Entropy, kJ/kg-K	
	Liquid (h_f)	Vapor(h_g)	Liquid (s_f)	Vapor (s_g)
20 ^{0}C	514.0	1705	4.53	8.593
-10 ^{0}C	374.0	1674.4	1.09	8.972

	(OR)			
4(a)	Classify the compressors used in refrigeration systems. Explain the working of single stage single acting reciprocating compressor with suitable sketch.	6M	CO1	L1
(b)	Illustrate the working of evaporative condenser.	6M	CO1	L2
5(a)	Demonstrate the working principle of actual vapor absorption refrigeration system with the help of neat sketch.	6M	CO1	L2

(b)	In a vapour absorption refrigeration system, the refrigeration temperature is −15 ^{0}C. The generator is operated by solar heat where the temperature reached is 100 ^{0}C. The temperature of heat sink is 50 ^{0}C. What is the maximum possible COP of the system?	6M	CO2	L3
	(OR)			
6(a)	State the various non-conventional refrigeration methods and explain the adiabatic demagnetization refrigeration system.	6M	CO1	L1
(b)	Explain the working principle of vertex-tube refrigeration system. What are the fields of its applications?	6M	CO1	L1
7(a)	Define the term by-pass factor used for heating and cooling coil and find the expression for that with suitable sketches.	6M	CO4	L3
(b)	The pressure, temperature, relative humidity of air at a place is 1.013bar, 32^{0}C and 65% respectively. Find: (i) The dew point temperature (ii) Specific enthalpy (iii) Degree of saturation (iv) The humidity ratio. The universal gas constant R_U=8.3143 kJ/kg mole.	6M	CO4	L2
	(OR)			
8(a)	What is an effective temperature? Explain the comfort chart.	6M	CO4	L1
(b)	An atmospheric air at 30 ^{0}C and 20% RH is brought to a temperature of 22 ^{0}C and 60% RH. It is achieved first by adiabatic humidification and then sensible heating. If the quantity of air flow is 500m^3/min, represent the process on psychrometric chart and determine the following parameters. (i) Capacity of humidifier (ii) Capacity of heating coil.	6M	CO4	L3
9(a)	Explain the working principle of summer air conditioning system with neat sketch.	6M	CO5	L2
(b)	Define the terms (i) RSHF (ii) BPF (iii) GRSHF (iv) ERSHF.	6M	CO5	L1
	(OR)			
10(a)	An air–conditioned plant is to be designed for a small office room for winter conditions. Out-door conditions = 10 ^{0}C DBT and 8 ^{0}C WBT Required conditions = 20 ^{0}C DBT and 60% RH Amount of free air circulation = 0.3 m^3/min/person Seating capacity of office = 50 The required condition is achieved first by heating and then by adiabatic humidifying. Determine (i) Heating capacity of the coil in kW and surface temperature required if the bypass factor of the coil is 0.32 (ii) The capacity Humidifier.	6M	CO5	L3
(b)	Distinguish between summer air conditioning system and the winter air conditioning system.	6M	CO5	L2

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