



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

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

B.Tech. (VI Semester) (R20) Semester End Examinations (Re-admitted Regular) April 2026

(for Re-admitted students)

TIME TABLE

Time : 10.00 AM to 01.00 PM

A.Y. : 2025-26

R20
(Re-Admitted)

Branch	30-04-2026 (Thursday)	02-05-2026 (Saturday)	05-05-2026 (Tuesday)	07-05-2026 (Thursday)	09-05-2026 (Saturday)
				Open Elective-II	Program Elective-II
CE	20CE18-Highway Engineering	20CE19-Design of Steel Structures	20CE20-Estimation and Quantity Surveying	20IT84 - Cyber Security and Digital Forensics	20CE22-Construction Management
ECE	20EC15-Microprocessors and Microcontrollers	20EC16-VLSI Design	20EC17-Microwave Engineering	20ME83-Operations Research Techniques	20EC19-Satellite Communications
IT	20CS17-Information Security	20CS18-Compiler Design	20CS19-Big Data Analytics	20CE82-Disaster Management	20IT04-Data Science

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

Date:

11 APR 2026

CONTROLLER OF EXAMINATIONS

PRINCIPAL

Copy to:

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2. T&P cell, Transport coordinator & Librarian
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**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)**

L.B.Reddy Nagar :: Mylavaram – 521 230 :: NTR Dist.: A.P.
B.Tech. (VI Semester) Regular Examinations

20CE18-HIGHWAY ENGINEERING

(CE)

Time : 3 hours

Max. Marks: 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain the objectives of highway planning.	7M	CO1	L2
(b)	Outline the Institutions for highway planning design and implementation at different levels.	7M	CO1	L2
(OR)				
2(a)	Describe with sketches the star and grid pattern.	7M	CO1	L2
(b)	Summarize the silent features that are used in preparation of detailed project report.	7M	CO1	L2
3(a)	Discuss the factors affecting stopping sight distance.	7M	CO2	L3
(b)	State the factors that govern the length of the summit curve. How is it decided?	7M	CO2	L3
(OR)				
4(a)	Explain the expression that are used to determine the extra widening of pavement on horizontal curve.	7M	CO2	L2
(b)	Calculate extra widening of pavement required on a horizontal curve of radius 700m on a two-lane highway, the design speed being 80kmph. Assume wheel base l=6m.	7M	CO2	L3
5(a)	List out the various desirable properties of coarse aggregate that are used in highway construction.	4M	CO3	L1
(b)	Explain the test conducted on coarse aggregate that are used to determine Aggregate Crushing Value.	10M	CO3	L2
(OR)				
6(a)	Explain the test that was conducted on bitumen to determine softening point.	7M	CO3	L2
(b)	Describe the modulus of sub grade reaction used in rigid pavement design.	7M	CO3	L2
7(a)	Outline the advantages and limitations of flexible pavement.	7M	CO4	L2
(b)	Discuss the westergaard's equation for wheel loads.	7M	CO4	L2
(OR)				
8.	Design a new flexible pavement for a two-lane undivided carriageway using the following data: Design CBR value of subgrade = 8.0%, Initial traffic on completion of construction=1800 cv per day, Average growth rate = 6% per year, Design life = 15 years, VDF value = 2.5. (Use CBR charts).	14M	CO4	L3
9(a)	Outline the various causes of traffic accidents.	7M	CO5	L2
(b)	Discuss traffic signals along with their advantages.	7M	CO5	L2
(OR)				
10(a)	Explain the following parameters used in traffic engineering. (i) Volume, (ii) Density	7M	CO5	L2
(b)	Discuss the factors affecting the speed studies in traffic engineering.	7M	CO5	L2

H.T.No

30 APR 2026

R20

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

B.Tech. (VI Semester) Regular Examinations

**20EC15-MICROPROCESSORS AND MICROCONTROLLERS
(ECE)**

Time : 3 hours

Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain in detail about the Maximum mode operation of the 8086 microprocessor.	7M	CO1	L2
(b)	Explain the interrupt response sequence of the 8086 processor.	7M	CO3	L2
(OR)				
2(a)	Explain the pin configuration of the 8086 processor with a neat sketch.	7M	CO1	L1
(b)	Draw and discuss the bit configuration of the flag register of the 8086 processor.	7M	CO1	L2
3(a)	Draw the control logic circuit of the timer/counter. Explain the timers modes operation of the 8051 microcontroller with necessary registers.	10M	CO1	L2
(b)	Write the difference between MOV, MOVX, and MOVC instructions of the 8051 microcontroller.	4M	CO2	L2
(OR)				
4(a)	Discuss the memory organization of the 8051 microcontroller.	7M	CO1	L2
(b)	Write an assembly language program using 8051 microcontroller instructions to generate a square wave at port 1, pin 0 (P1.0). The frequency of the generated square wave is to be 1KHz.	7M	CO4	L3
5(a)	Describe the key features of the ARM processor architecture.	7M	CO1	L2
(b)	Explain in detail about the register bank registers of the ARM processor.	7M	CO1	L2
(OR)				
6(a)	Describe the difference between maskable and non-maskable interrupts.	4M	CO3	L2
(b)	Provide an overview of the different types of instructions supported by the ARM processor.	10M	CO2	L1
7(a)	What are the steps involved in assembling and running an ARM assembly language program on a target device?	7M	CO2	L2
(b)	Discuss the difference between conditional and unconditional branch instructions, providing examples of each.	7M	CO2	L2
(OR)				
8(a)	How are read-only and read-write memory regions typically managed in ARM-based systems?	7M	CO1	L2
(b)	Discuss the syntax and semantics of instructions like LDM and STM, highlighting their advantages in certain scenarios.	7M	CO2	L2
9(a)	Interfacing a DAC with an ARM processor and also develop an assembly language program.	7M	CO4	L3
(b)	Interface and write an assembly language program for interfacing of GSM module with ARM processor.	7M	CO4	L3
(OR)				
10(a)	Explain how LEDs can be interfaced with an ARM processor and also develop an ALP.	7M	CO4	L3
(b)	Describe the procedure for interfacing an RTC module with an ARM-based system.	7M	CO4	L3

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B.Tech. (VI Semester) Regular Examinations

20CS17-INFORMATION SECURITY

(IT)

Time : 3 hours

Max. Marks : 70M

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain about the security attacks in Information Security with neat diagram.	7M	CO1	L2
(b)	What are the security mechanisms used in Information Security? Explain.	7M	CO1	L2
(OR)				
2(a)	Illustrate the Information Security Model with explanation and neat diagram.	7M	CO1	L3
(b)	Discuss the types of Block Cipher modes of Operations. Explain with a neat diagram.	7M	CO1	L2
3.	Define Hash Function? Explain the SHA-512 Hash Algorithm with compression function?	14M	CO2	L2
(OR)				
4(a)	Define Prime and Co-Primes. Explain the RSA Algorithm.	7M	CO2	L2
(b)	What is MAC? Explain the process of CMAC and HMAC.	7M	CO2	L2
5(a)	Explain the Public and Private Key Ring Tables and its contents in PGP.	7M	CO3	L2
(b)	Define ISAKMP and explain why it is needed in IPsec.	7M	CO3	L2
(OR)				
6(a)	Define ESP and the security services it provides in IPsec.	7M	CO3	L2
(b)	Explain any four types of payloads used in IPsec.	7M	CO3	L2
7(a)	Compare and contrast the Handshake Protocol in SSL and TLS.	7M	CO4	L2
(b)	Explain the encryption and Decryption process in SET.	7M	CO4	L2
(OR)				
8(a)	Define the different types of tags and its syntaxes used in HTML.	7M	CO4	L2
(b)	Describe the HTTP requests and Responses processing.	7M	CO4	L2
9(a)	What is IDS? Explain its usages?	7M	CO5	L1
(b)	Explain the Firewall Design Principles.	7M	CO5	L2
(OR)				
10(a)	Explain the types of viruses and its properties.	7M	CO5	L2
(b)	Explain the Detection Intrusion techniques used in IDS.	7M	CO5	L2

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L.B. Reddy Nagar :: Mylavaram – 521 230 :: NTR Dist.: A.P.
B.Tech. (VI Semester) Regular Examinations

20CE19-DESIGN OF STEEL STRUCTURES

(CE)

Time : 3 hours

Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Two ISF sections 200mm X 10mm each and 1.5m long are to be jointed to make a member length of 3m. Design a butt joint with the bolts arranged in the diamond pattern. The flats are supposed to carry a factored tensile force of 450kN. Steel is of grade Fe410. 20mm diameter bolts of grade 4.6 are used to make the connection. Also determine the net tensile strength of the main plate and cover plates.	7M	CO1	L3
(b)	List out the types of bolted connections and explain along with neat sketches.	7M	CO1	L2
(OR)				
2(a)	Draw the neat sketches for different types of welds.	7M	CO1	L2
(b)	Design a double cover butt joint to connect two plates each 12mm thick and 300mm wide. The service load to be transferred is 200 kN.	7M	CO1	L3
3.	Design a single angle section for a tension member of truss to carry a factored tensile force of 350kN. Use 20mm bolts of grade 4.6 for connection.	14M	CO2	L3
(OR)				
4.	Design a double angle discontinuous strut to carry a factored load of 135kN, resulting from combination with wind load. The length of the strut is 3m between intersections. The two angles are placed back-back and are tack bolted. Use steel of grade Fe410. (i) Angles are placed on opposite sides of 12mm gusset plate. (ii) Angles are placed same side of 12mm gusset plate.	14M	CO2	L3
5.	Design a simply supported steel joist with a 4.5m effective span carries a UDL of 50kN over its span inclusive of its self weight. The beam is supported laterally throughout and steel of grade Fe410	14M	CO3	L3
(OR)				
6.	Design a steel beam section for supporting a roof of a big hall for the following data and apply the usual checks. Assume steel grade of Fe 410. Clear span 6m, end bearings 150mm, factored dead load 20kN/m, factored live load 45kN/m, restriction on beam depth 375mm. The compression flange of the beam is laterally supported throughout.	14M	CO3	L3
7.	Design a batten system for the column 12m long to carry a factored axial load of 1500kN. The column is restrained in position but not in direction at both ends. Assume that two channels are kept toe-to-toe.	14M	CO4	L3
(OR)				
8.	Design a suitable slab base for a column ISHB 350@710.2 N/m subjected to an factored axial compressive load of 1900kN. The base rests on concrete pedestal of grade M15.	14M	CO4	L3
9(a)	List out the IS specifications for AC sheets and GI sheets.	7M	CO5	L2
(b)	Explain the following and write the IS standards (i) Pitch of trusses (ii) Spacing of trusses.	7M	CO5	L2
(OR)				
10.	Design an I section purlin for an industrial building situated to support a galvanized corrugated iron sheet roof for the following data: Spacing of the truss c/c – 6m Span of truss- 18m Slope of truss-30°, spacing of purlin-1.5m, wind pressure- 2.5 kN/m², weight of galvanized sheets- 150N/m², grade of steel Fe410.	14M	CO5	L3

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02 MAY 2026

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

B.Tech. (VI Semester) Regular Examinations

20EC16-VLSI DESIGN

(ECE)

RA

Time : 3 hours

Max. Marks :70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Summarize CMOS Inverter transfer characteristics and explain the different regions of operation.	7M	CO1	L2
(b)	Derive the pull-up to pull-down ratio for an NMOS inverter driven through another inverter.	7M	CO1	L3
(OR)				
2(a)	With neat sketch, explain the CMOS p-well fabrication process.	7M	CO1	L2
(b)	Identify the alternative forms of pull up with diagrams.	7M	CO1	L1
3(a)	Develop the Layout and stick diagram for 2 input CMOS NOR gate.	7M	CO2	L2
(b)	Explain about CMOS lambda based design rules for transistors and contact cuts.	7M	CO2	L2
(OR)				
4(a)	Calculate the delay for the nMOS Inverter pair.	7M	CO2	L3
(b)	Determine the scaling factors for the following (i) Gate area (ii) Gate Capacitance (iii) Power dissipation per unit area (iv) Gate delay (v) Channel Resistance.	7M	CO2	L2
5(a)	Design D Flip-flop using transmission gate.	7M	CO3	L2
(b)	Model the static complementary gate that computes $[(A+B)C]'$.	7M	CO3	L3
(OR)				
6(a)	Discuss switch logic using pass transistors and transmission gates.	7M	CO3	L2
(b)	Illustrate the operation of Array Multiplier.	7M	CO3	L2
7(a)	Elaborate the significance of current mirror and explain n-channel current mirror circuit.	7M	CO3	L2
(b)	Calculate noise in telescopic op-amp.	7M	CO3	L2
(OR)				
8(a)	Model two stage op-amp with single-ended output.	7M	CO3	L2
(b)	Build Bootstrap reference circuit and explain its V-I characteristics.	7M	CO3	L2
9(a)	Outline the two different modes of scan operation.	7M	CO4	L2
(b)	Illustrate combinational logic testing using D-Algorithm.	7M	CO4	L2
(OR)				
10(a)	Describe BILBO test technique with suitable diagrams.	7M	CO4	L2
(b)	Differentiate Defect, Fault and Error and give some examples of manufacturing defects.	7M	CO4	L2

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B.Tech. (VI Semester) Regular Examinations

20CS18-COMPILER DESIGN

(IT)

Time : 3 hours

Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1.	With neat diagram explain different phases of compiler. Mention the input and output of each phase with an example.	14M	CO1	L2
(OR)				
2(a)	Differentiate: (i) Pass and phase of a compiler; (ii) Front end and back end of a compiler.	7M	CO1	L2
(b)	Why lexical and syntax analyzer are separate?	7M	CO1	L1
3.	Consider the following grammar $S \rightarrow AaAb$ $S \rightarrow BbBa$ $A \rightarrow \epsilon$ $B \rightarrow \epsilon$ Construct LL(1) parse table and check whether the string 'ba' is acceptable (or) not.	14M	CO2	L3
(OR)				
4(a)	Consider the grammar: $E \rightarrow E+E$ $E \rightarrow E^*E$ $E \rightarrow id$ Perform shift reduce parsing of the input string "id1+id2+id3"	7M	CO2	L3
(b)	Write an algorithm for constructing a predictive parsing table. Give Example.	7M	CO2	L2
5(a)	Write the algorithm for construction of a Simple LR parsing table.	7M	CO3	L2
(b)	Construct a set of LR(0) items for a grammar given below. $S \rightarrow L=R$ $S \rightarrow R$ $L \rightarrow *R$ $L \rightarrow id$ $R \rightarrow L$.	7M	CO3	L3
(OR)				
6(a)	What are the limitations in SLR parser? How they are rectified in CLR and LALR parsers?	7M	CO3	L1
(b)	Write and explain the LR Parsing algorithm.	7M	CO3	L2
7(a)	Distinguish between Static and Dynamic storage allocation.	7M	CO4	L2
(b)	What is activation record? Write the various fields of Activation Record.	7M	CO4	L1
(OR)				
8(a)	Write quadruples, triples and indirect triples for the expression: - $(a*b)+(c+d)-(a+b+c+d)$.	7M	CO4	L2
(b)	Write the short note on: (i) Abstract syntax tree (ii) Polish notation (iii) Three address code (iv) Back patching.	7M	CO4	L2
9(a)	Outline the following peephole optimization techniques; (i) Elimination of Redundant Code (ii) Elimination of Unreachable Code.	7M	CO5	L4
(b)	Summarize about Register Allocation and Assignment.	7M	CO5	L2
(OR)				
10(a)	Illustrate the following terms: (i) Register Descriptor (ii) Address Descriptor.	7M	CO5	L4
(b)	Explain the basic functionalities of IN, OUT and KILL in data flow analysis.	7M	CO5	L2

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B.Tech. (VI Semester) Regular Examinations

**20CE20-ESTIMATION AND QUANTITY SURVEYING
(CE)**

Time : 3 hours

Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	An arch of 2.50 m span subtends an angle of 80 degrees at the centre. The thickness of arch is 30 cm and the breadth of wall is 40 cm. Calculate the quantity of arch masonry work.	7M	CO2	L3
(b)	Describe the following main items of work. (i) Concrete in foundation (ii) Soling (iii) Damp proof course.	7M	CO1	L2
(OR)				
2	Determine the following quantities for the step as shown in fig. (i) Earthwork in excavation (ii) Concrete in foundation (iii) Brickwork (iii) Finishing 20 mm cement plastered. Fig. 1	14M	CO2	L3
3.	Estimate the quantities of reinforcement and draw sketches showing arrangements of reinforcement for the beam shown below. LONG SECTION	14M	CO2	L3
(OR)				

20CE20-ESTIMATION AND QUANTITY SURVEYING

4.	Determine the quantities of filling for a portion of road from chainage 0 to chainage 60 from the following data. Formation width of the road is 10 m. Side slopes are 2:1 in banking. Length of chain is 30 m.	14M	CO2	L3																								
	<table><tr><td>Chainage (m)</td><td>0</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td></tr><tr><td>Ground level(m)</td><td>105.00</td><td>105.60</td><td>105.44</td><td>105.90</td><td>105.32</td><td>104.62</td><td>103.75</td></tr><tr><td>R.L. of formation</td><td>107.00</td><td colspan="3">Downward gradient of 1 in 150</td><td colspan="3">Downward gradient of 1 in 100</td></tr></table>				Chainage (m)	0	10	20	30	40	50	60	Ground level(m)	105.00	105.60	105.44	105.90	105.32	104.62	103.75	R.L. of formation	107.00	Downward gradient of 1 in 150			Downward gradient of 1 in 100		
Chainage (m)	0				10	20	30	40	50	60																		
Ground level(m)	105.00				105.60	105.44	105.90	105.32	104.62	103.75																		
R.L. of formation	107.00	Downward gradient of 1 in 150			Downward gradient of 1 in 100																							
5(a)	Describe the earthwork cases in canals with neat sketches.	7M	CO2	L2																								
(b)	Discuss the general specifications of a first-class building.	7M	CO3	L2																								
(OR)																												
6(a)	Summarize the detail specifications of hand mixing and machine mixing in cement concrete.	7M	CO3	L1																								
(b)	Describe the purpose and method of writing specifications for building estimation.	7M	CO3	L2																								
7(a)	Discuss about the work charged establishment in P.W.D. works.	7M	CO3	L2																								
(b)	Describe the analysis of rate of item in building works.	7M	CO3	L2																								
(OR)																												
8(a)	Determine the materials required for 10 cu m of concrete for 1:4:8 proportion.	7M	CO3	L3																								
(b)	Define the following terms: (i) Contract (ii) Tender (iii) Tender notice.	7M	CO3	L1																								
9(a)	Differentiate between cost and value.	7M	CO4	L2																								
(b)	Define and describe scrap value and salvage value.	7M	CO4	L2																								
(OR)																												
10(a)	A person has purchased an old building at a cost of Rs. 90,000/- on the basis that the cost of land is Rs. 50,000/- and the cost of building structure is Rs. 40,000/-. Considering the future life of the building structure be 20 years, determine the amount of annual sinking fund at 4% interest when scrap value is 10% of the cost of building structure.	7M	CO4	L3																								
(b)	Discuss about the mortgage in valuation of building.	7M	CO4	L2																								

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B.Tech. (VI Semester) Regular Examinations

20EC17-MICROWAVE ENGINEERING

(ECE)

RA

Time : 3 hours

Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain what is meant by the "Cut-Off wavelength". Explain the dominant mode of a wave guide.	7M	CO4	L2
(b)	Determine the Cut-Off wavelength for dominant mode in a rectangular waveguide of breadth 10cm. For a 2.5GHz signal propagated in the waveguide, calculate the guide wavelength, the group and phase velocities.	7M	CO4	L2
(OR)				
2(a)	What is the relation between $\lambda_g, \lambda_0, \lambda_c$ in a waveguide? Derive it.	7M	CO4	L2
(b)	A rectangular waveguide of cross section 5cm × 2cm is used to propagate TM_{11} mode at 9GHz. Determine cut-off wavelength & Wave impedance.	7M	CO2	L3
3(a)	Draw the structure of Reflex Klystron? Explain its Operation with the help of Apple Gate Diagram.	7M	CO2	L2
(b)	The Operating Voltage of reflex Klystron is 10 GHz. It has a DC beam voltage of 200V, a repeller spacing of 0.1 cm for $1\frac{3}{4}$ mode. Determine the maximum value of Power and corresponding repeller voltage for a beam current of 60mA.	7M	CO4	L3
(OR)				
4(a)	Draw the Schematic diagram of Two-Cavity Klystron amplifier and explain its operation briefly.	7M	CO2	L2
(b)	A Two Cavity Klystron operates at 10GHz with $I_0=3.5mA$, $V_0=10kV$. The drift space length is 3cm and the output cavity total shunt capacitance is $G_{sh}=20 \mu mho$ with beam coupling coefficient $\beta_0=0.92$. Find the maximum Voltage gain.	7M	CO4	L3
5(a)	Explain the different types of slow-wave structures used in TWT. Compare TWT with Klystron.	7M	CO2	L2
(b)	The Travelling Wave Tube (TWT) is operated at a frequency $f=10GHz$ with Voltage $V_0=3kV$ and beam current $I_0=30mA$. If the Circuit length $N_t=50$ and characteristic impedance of the helix is $Z_0=10\Omega$ then determine the following. (i) The gain parameter (ii) The Output power gain A_p in decibels (iii) All four Propagation constants.	7M	CO4	L3
(OR)				
6(a)	With a neat diagram, discuss the mechanism of oscillation and operation of magnetron.	7M	CO2	L2
(b)	The magnetic flux density of a normal circular magnetron is $0.2 Wb/m^2$ and find the cut-off flux density if $V_0=2kV$. If the core radius = 2mm and anode radius = 4mm, then determine Hull cut-off voltage.	7M	CO4	L3
7(a)	What are Avalanche Transit time devices? Explain operation, construction and application of IMPATT Diode.	7M	CO2	L2
(b)	Discuss different modes of operation of GUNN diode.	7M	CO2	L2
(OR)				
8(a)	What are the Operating frequencies of TRAPATT devices? Describe the basic operating mechanism of TRAPATT diode using suitable sketches.	7M	CO4	L2
(b)	Explain how decrease in drift velocity with increasing electric field can lead to formation of high field domain for microwave generation and amplification.	7M	CO4	L2
9(a)	Explain the working of Two-hole directional coupler with a neat diagram.	7M	CO3	L2
(b)	Explain about E-plane Tee junction with a neat sketch. Why it is called a series junction.	7M	CO3	L2
(OR)				
10(a)	Draw the 4-port Hybrid Junction. Derive its S-matrix.	7M	CO3	L2
(b)	A 90W power source is connected to the input of a directional coupler with $C=20dB$, $D=35dB$ and an insertion loss of 0.5dB. Find the output powers at each ports. Assume all the ports are matched.	7M	CO3	L4

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05 MAY 2026

R20

Page 99/5/5/26

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B.Tech. (VI Semester) Regular Examinations

20CS19-BIG DATA ANALYTICS

(IT)

RA

Time : 3 hours

Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain Hadoop Streaming with neat sketch.	7M	CO1	L2
(b)	Describe the following tools of Hadoop Eco System. (i) Hive (ii) Map Reduce (iii) YARN (iv) Zoo Keeper.	7M	CO1	L2
(OR)				
2(a)	Describe characteristics and applications of Big data.	7M	CO1	L2
(b)	Explain types of digital data and evolution of Big data.	7M	CO1	L2
(OR)				
3(a)	Explain serialization in Hadoop.	7M	CO2	L2
(b)	Utilize any 7 commands to interact with HDFS.	7M	CO2	L3
(OR)				
4(a)	Describe responsibilities of the following Nodes in Hadoop Cluster. (i) Name Node (ii) Data Node (iii) Secondary Name Node.	7M	CO2	L2
(b)	Explain architecture of Hadoop with neat sketch.	7M	CO2	L2
(OR)				
5.	Apply Map Reduce approach to perform analysis on any real-time dataset.	14M	CO3	L3
(OR)				
6(a)	Explain Map Reduce anatomy with neat sketch.	7M	CO3	L2
(b)	Describe data types and formats of Map Reduce framework.	7M	CO3	L2
(OR)				
7(a)	Explain DML commands in HiveQL.	4M	CO4	L2
(b)	Utilize Sqoop tool to perform importing of the following data into HDFS and data export back to a relational database. (1, 'Alice', 30, 'HR'), (2, 'Bob', 25, 'IT'), (3, 'Charlie', 35, 'Finance');	10M	CO4	L3
(OR)				
8(a)	Explain HiveQL with examples.	7M	CO4	L2
(b)	Demonstrate architecture of Hive with neat sketch.	7M	CO4	L2
(OR)				
9(a)	Compare HBase with RDBMS.	7M	CO5	L2
(b)	Make use of the following Piglatin tools to perform analysis on any real-time data. (i) Load (ii) ForEach (iii) Group By (iv) Filter.	7M	CO5	L3
(OR)				
10(a)	Explain Clients of HBase.	7M	CO5	L2
(b)	Describe User defined functions in Pig Latin.	7M	CO5	L2

**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)**

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

B.Tech. (VI Semester) Regular Examinations

**20IT84 - CYBER SECURITY AND DIGITAL FORENSICS
(CE)**

18/05/26
7/5/26

RA

Time : 3 hours

Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain attacks on mobile phones from the perspective of theft, viruses, mishing, vishing, smishing, and hacking bluetooth.	7M	CO1	L2
(b)	Describe the following • Network and cyber attacks • Cybercafe and cybercrimes	7M	CO1	L1
(OR)				
2(a)	Outline the types of stalkers, the workings of stalking, and cases reported on cyberstalking.	7M	CO1	L3
(b)	Illustrate any 7 types of classification of cybercrimes.	7M	CO1	L3
3(a)	Discuss the types of buffer overflow and techniques how to minimize buffer overflow.	7M	CO2	L2
(b)	Summarize DoS and DDoS attacks covering their classification, levels, tools used to launch, attacks, and protection.	7M	CO2	L2
(OR)				
4(a)	Explain about the types of viruses, protection from Trojan horses and backdoors.	7M	CO2	L2
(b)	Determine the types, and techniques of identity thefts and PII.	7M	CO2	L2
5.	Contrast the differences between malware forensics, and network forensics.	14M	CO3	L2
(OR)				
6(a)	Outline the importance of disk forensics and network forensics.	7M	CO3	L2
(b)	Explain about mobile forensics and email forensics.	7M	CO3	L2
7(a)	Infer the challenges rose while collecting digital evidence on the internet.	7M	CO4	L2
(b)	Demonstrate how operating system and their boot processes relate to digital evidence.	7M	CO4	L3
(OR)				
8(a)	Explain the use of Windows registry and Windows artifact.	7M	CO4	L2
(b)	Describe how forensic tools are used for integrity verification hashing, and email analysis.	7M	CO4	L2
9(a)	Summarize the importance of cyber forensic suite.	7M	CO5	L2
(b)	Outline the roles of forensic tools in password recovery, and data recovery.	7M	CO5	L3
(OR)				
10(a)	Discuss the roles of forensic tools used for analyzing network and integrity verification hashing.	7M	CO5	L2
(b)	Interpret the significance of drive imaging and validation tools	7M	CO5	L2

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

B.Tech. (VI Semester) Regular Examinations

**20ME83-OPERATIONS RESEARCH TECHNIQUES
(ECE)**

Time : 3 hours

Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No		Questions	Marks	CO	BL																																				
1(a)	State different types of models used in operations research. Explain any two in detail.		7M	CO1	L1																																				
(b)	Old hens can be brought at Rs 2 each and young ones at Rs 5 each. The old hens lay 3 eggs per week and the young ones lay 5 eggs per week, each egg being worth 30 paise. A hen cost Rs 1 per week to feed. If I have only Rs 80 to spend for hens, how many hens of each kind should I buy to give a profit of more than Rs 6 per week assuming that I cannot house more than 20 hens? Solve graphically.		7M	CO1	L3																																				
(OR)																																									
2.	Use penalty (Big-M) method to solve Maximize $Z = 3x_1 - x_2$ Subject to $2x_1 + x_2 \geq 2$ $x_1 + 3x_2 \leq 3$ $x_2 \leq 4$ and $x_1, x_2 \geq 0$		14M	CO1	L3																																				
3.	Find the optimal solution to the following transportation problem. <table><tr><td></td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>Supply</td></tr><tr><td>O₁</td><td>23</td><td>27</td><td>16</td><td>18</td><td>30</td></tr><tr><td>O₂</td><td>12</td><td>17</td><td>20</td><td>51</td><td>40</td></tr><tr><td>O₃</td><td>22</td><td>28</td><td>12</td><td>32</td><td>53</td></tr><tr><td>Demand</td><td>22</td><td>35</td><td>25</td><td>41</td><td></td></tr></table>			D ₁	D ₂	D ₃	D ₄	Supply	O ₁	23	27	16	18	30	O ₂	12	17	20	51	40	O ₃	22	28	12	32	53	Demand	22	35	25	41		14M	CO2	L3						
	D ₁	D ₂	D ₃	D ₄	Supply																																				
O ₁	23	27	16	18	30																																				
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O ₃	22	28	12	32	53																																				
Demand	22	35	25	41																																					
(OR)																																									
4(a)	Briefly explain the Hungarian Method procedure with example. Also write the assumptions.		7M	CO2	L2																																				
(b)	Solve the following travelling salesman problem <table><tr><td></td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td></tr><tr><td>A</td><td>-</td><td>4</td><td>7</td><td>3</td><td>4</td></tr><tr><td>B</td><td>4</td><td>-</td><td>6</td><td>3</td><td>4</td></tr><tr><td>C</td><td>7</td><td>6</td><td>-</td><td>7</td><td>5</td></tr><tr><td>D</td><td>3</td><td>3</td><td>7</td><td>-</td><td>7</td></tr><tr><td>E</td><td>4</td><td>4</td><td>5</td><td>7</td><td>-</td></tr></table>			A	B	C	D	E	A	-	4	7	3	4	B	4	-	6	3	4	C	7	6	-	7	5	D	3	3	7	-	7	E	4	4	5	7	-	7M	CO2	L3
	A	B	C	D	E																																				
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B	4	-	6	3	4																																				
C	7	6	-	7	5																																				
D	3	3	7	-	7																																				
E	4	4	5	7	-																																				
5(a)	Explain the theory of dominance in the solution of rectangular games.		4M	CO3	L2																																				
(b)	Solve the following game graphically <table><tr><td>2</td><td>2</td><td>3</td><td>-2</td></tr><tr><td>4</td><td>3</td><td>2</td><td>6</td></tr></table>		2	2	3	-2	4	3	2	6	10M	CO3	L3																												
2	2	3	-2																																						
4	3	2	6																																						
(OR)																																									
6(a)	What are the assumptions made in sequencing?		4M	CO3	L1																																				

20ME83-OPERATIONS RESEARCH TECHNIQUES

(b)	There are 5 jobs each of which is to be processed on three machines A, B, and C in the order ACB. The time required to process in hours is given in the matrix below. Find the optimal sequence and total elapsed time. Also find idle time at each machine. <table><tr><td>Job:</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>Machine A</td><td>3</td><td>8</td><td>7</td><td>5</td><td>4</td></tr><tr><td>Machine C</td><td>4</td><td>5</td><td>1</td><td>2</td><td>3</td></tr><tr><td>Machine B</td><td>7</td><td>9</td><td>5</td><td>6</td><td>10</td></tr></table>	Job:	1	2	3	4	5	Machine A	3	8	7	5	4	Machine C	4	5	1	2	3	Machine B	7	9	5	6	10	10M	CO3	L3			
Job:	1	2	3	4	5																										
Machine A	3	8	7	5	4																										
Machine C	4	5	1	2	3																										
Machine B	7	9	5	6	10																										
7(a)	A machine owner finds from his past records that the costs per year of maintaining a machine whose purchase price is Rs.6000 are as given below: <table><tr><td>year</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>Maintenance cost in Rs.</td><td>1000</td><td>1200</td><td>1400</td><td>1800</td><td>2300</td><td>2800</td><td>3400</td><td>4000</td></tr><tr><td>Resale price in Rs.</td><td>3000</td><td>1500</td><td>750</td><td>375</td><td>200</td><td>200</td><td>200</td><td>200</td></tr></table> Determine at what age is a replacement due?	year	1	2	3	4	5	6	7	8	Maintenance cost in Rs.	1000	1200	1400	1800	2300	2800	3400	4000	Resale price in Rs.	3000	1500	750	375	200	200	200	200	7M	CO4	L3
year	1	2	3	4	5	6	7	8																							
Maintenance cost in Rs.	1000	1200	1400	1800	2300	2800	3400	4000																							
Resale price in Rs.	3000	1500	750	375	200	200	200	200																							
(b)	Discuss in brief, replacement procedure for the items that deteriorate with time.	7M	CO4	L2																											
(OR)																															
8(a)	Briefly explain the important characteristics of queuing system.	7M	CO4	L2																											
(b)	A person repairing radios find that the time spent on the radio sets has exponential distribution with mean 20minutes. If the radios are repaired in the order in which they come in and their arrival is approximately Poisson with an average rate of 15 for 8 hour day. What is the repairman's expected idle time each day? How many jobs are ahead of the average set just brought in?	7M	CO4	L3																											
9(a)	Derive the equation for EOQ with no shortages and production rate is infinite. What are the assumptions involved?	7M	CO5	L2																											
(b)	The production department of a company requires 3,600kg of raw material for manufacturing a particular item per year. It has been estimated that the cost of placing an order is Rs. 36 and the cost of carrying inventory is 25% of the investment in the inventories. The price is Rs. 10 per kg. Help the purchase manager to determine an ordering policy for a raw material.	7M	CO5	L3																											
(OR)																															
10(a)	Write about the applications of dynamic programming.	4M	CO5	L1																											
(b)	Solve the following linear programming problem by dynamic programming approach. Maximize $Z = 2x_1 + 5x_2$, Subject to the constraints $2x_1 + x_2 \leq 43$ $2x_2 \leq 46$ $x_1, x_2 \geq 0$	10M	CO5	L3																											

H.T.No

07 MAY 2026

R20

**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)**

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

B.Tech. (VI Semester) Regular Examinations

20CE82-DISASTER MANAGEMENT

(IT)

Time : 3 hours

Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Distinguish between natural and man-made disasters.	7M	CO1	L2
(b)	Discuss briefly the functions of disaster management.	7M	CO1	L2
(OR)				
2(a)	Discuss in brief the Disaster Management Act 2005.	7M	CO1	L2
(b)	Describe the role of a disaster manager during disaster phase of disaster management cycle.	7M	CO1	L2
3.	Examine the impact of landslide on habitation, agriculture, and environmental loss.	14M	CO1	L2
(OR)				
4(a)	Discuss the Impacts of disaster on human health.	7M	CO1	L2
(b)	Explain how you will assess the loss and damage to human life in disasters.	7M	CO1	L2
5(a)	State the importance of indigenous knowledge and explain how it is helpful in disaster management.	7M	CO2	L2
(b)	Relate the relevance of indigenous knowledge in disaster risk reduction technological and economical aspect.	7M	CO2	L2
(OR)				
6(a)	Discuss the role of remote sensing systems in disaster management.	7M	CO2	L2
(b)	What are the different types of droughts? Suggest relief and rehabilitation measures for drought.	7M	CO2	L2
7(a)	Explain early warning system in disaster management.	7M	CO3	L2
(b)	Explain how food security can become a solution to prevent drought.	7M	CO3	L2
(OR)				
8(a)	Define soil erosion. What is its relationship with floods?	7M	CO3	L2
(b)	Explain the factors to be considered for preparation of effective disaster planning.	7M	CO3	L2
9(a)	State the necessity of community awareness and participation in disaster.	7M	CO4	L2
(b)	Discuss the necessity of disaster education in schools.	7M	CO4	L2
(OR)				
10.	In case of manmade disaster like "Mumbai Terror attack", write about preventive actions and mitigation measures could have been taken, and the response to the disaster in disaster management.	14M	CO4	L2

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

B.Tech. (VI Semester) Regular Examinations
20CE22-CONSTRUCTION MANAGEMENT
(CE)

1603.001
7/5/22

RA

Time : 3 hours

Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Mention the functions of construction management and give its applications.	7M	CO1	L1
(b)	Discuss the qualities of a project manager.	7M	CO1	L2
(OR)				
2.	Enumerate the phases in the life cycle of a construction project with flow chart.	14M	CO1	L2
3(a)	Enlist the advantages and disadvantages of planning in construction management.	7M	CO1	L2
(b)	Describe the importance of project planning.	7M	CO1	L2
(OR)				
4(a)	Enumerate the general principles to be followed in forming an organization system.	10M	CO1	L2
(b)	State the advantages and disadvantages of functional organization.	4M	CO1	L2
5(a)	Define inventory control and mention its advantages.	7M	CO3	L1
(b)	Mention the objectives of material management in construction industry.	7M	CO3	L1
(OR)				
6.	Discuss the classification of construction equipment's according to type of works it performs.	14M	CO3	L2
7.	Determine the critical path for the given network. Numbers indicates time in weeks.	14M	CO2	L3
(OR)				
8.	The network shown below has the estimated duration for each activity marked. Determine the total float, free float and independent float for each activity and establish the critical path.	14M	CO2	L3
(OR)				
9(a)	Enlist the salient features of contract document.	7M	CO4	L2
(b)	Discuss the use of a measurement book.	7M	CO4	L2
(OR)				
10(a)	Explain the types of contracts in construction project.	10M	CO4	L2
(b)	Define the term 'Contract'. Bring out its importance in construction management.	4M	CO4	L2

H.T.No.

09 MAY 2026

R20

**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)**

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

B.Tech. (VI Semester) Regular Examinations

20EC19-SATELLITE COMMUNICATIONS

(ECE)

RA

Time : 3 hours

Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Mention the different frequency allocations used for satellite services.	7M	CO1	L2
(b)	Describe the general structure of satellite communication system.	7M	CO1	L2
(OR)				
2(a)	Write the applications of Satellite Communication.	7M	CO1	L2
(b)	Compare LEO, MEO, GEO.	7M	CO2	L2
3(a)	Summarize the orbital elements of a satellite with the help of diagram.	7M	CO1	L2
(b)	Calculate the (i) orbital time period (ii) eccentricity for a satellite whose apogee height is 4000 km and perigee height is 1000km. Assume radius of earth 6378km.	7M	CO3	L3
(OR)				
4(a)	Derive the expression for orbital period of satellite from kepler's third law.	7M	CO3	L3
(b)	Derive the Expressions for look angles in both azimuth and elevation directions.	7M	CO3	L3
5(a)	Explain Telemetry, Tracking and command subsystem With a neat diagram.	7M	CO2	L2
(b)	Determine the system noise temperature of a 4GHz receiver with following parameter: $T_{in}=25K$, $T_{RF}=50K$, $T_{IF}=1000K$, $T_m=500K$, $G_{RF}=23dB$, $G_{IF}=29 dB$, and $G_m = -10dB$.	7M	CO2	L3
(OR)				
6(a)	Develop the relation between C/N and G/T ratio of an earth station.	7M	CO2	L3
(b)	Describe the functions of attitude and orbital control with relevant diagram.	7M	CO1	L2
7(a)	Explain the frame structure of a TDMA system with reference burst and traffic burst.	7M	CO2	L2
(b)	Interpret the parameters responsible for the selection of Earth station.	7M	CO2	L2
(OR)				
8(a)	Discuss the operating principle of CDMA with example.	7M	CO4	L2
(b)	Draw the transmit-receive Earth station block diagram and discuss its functions.	7M	CO2	L2
9(a)	Discuss the GPS Architecture with neat sketches.	7M	CO1	L2
(b)	Elaborate the applications of GPS.	7M	CO1	L2
(OR)				
10(a)	Describe the functioning of VSAT.	7M	CO1	L2
(b)	Summarize the concepts of DTH technology.	7M	CO1	L2

H.T.No

09 MAY 2026

R20

**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)**

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

B.Tech. (VI Semester) Regular Examinations

20IT04-DATA SCIENCE

(IT)

Time : 3 hours

Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Describe about different Data Structures used in data science with example.	7M	CO1	L2
(b)	How to select variable and model for data exploration in model planning?	7M	CO1	L2
(OR)				
2(a)	Write about need and applications of data science.	7M	CO1	L2
(b)	Discuss the use of the Analytic Sandbox.	7M	CO1	L2
3(a)	How the data is distributed in normal distribution?	7M	CO2	L2
(b)	Consider the following sales data 950,350,400,500,200,550,600,300,600,700,700,200,700,600,350,500,450,400. Represent the above data using (i) barchart (ii) histogram.	7M	CO2	L3
(OR)				
4(a)	A teacher reported a mean of 35 marks in a class of 20 students. Later she realized that marks of a student were actually 45, but by mistake, she had written 25. Find the correct mean marks of the class.	7M	CO2	L3
(b)	Write about student t-test with example.	7M	CO2	L2
5(a)	Explain the steps in data cleaning.	7M	CO3	L2
(b)	Discuss the Min-Max tranformation normalization technique. Normalize the Weight variable to the range 0-1 using min-max. the weight variable have the values : 10, 115, 96, 41, 79, 109, 73, 104, 64, 136.	7M	CO3	L3
(OR)				
6(a)	How to convert continuous variables to categories?	7M	CO3	L2
(b)	List the steps to convert text data into the numeric data using BOW technique.	7M	CO3	L2
7.	Illustrate the concept of K-means clustering with an example.	14M	CO4	L2
(OR)				
8(a)	Discuss how scatterplots can be used to visualise the relationships between the variables.	7M	CO4	L2
(b)	How do you interpret a Kendall Tau coefficient?	7M	CO4	L2
9(a)	What are the key matrices used to check the performance of linear and multiple and logistic regression models?	7M	CO5	L2
(b)	What is a summary table? How can it be used to summarize and compare data of variables or groups?	7M	CO5	L2
(OR)				
10(a)	How does Naïve Bayes classifier work?	7M	CO5	L2
(b)	Differentiate between Linear regression and Logistic regression.	7M	CO5	L2
