R16

IV B.TECH I SEM

SUPPLEMENTARY EXAMINATIONS

MARCH 2025

Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CE4101

IV B.Tech I Semester Supple Examinations, March-2025

ESTIMATION COSTING AND VALUATION

(CE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) What are the units of measurement for i) Soling and ii) Cornice

(b) Explain about Long and Short wall Method with the help of Formulas.

(c) List out different cases of Canal Estimating.

(d) What do you mean by Detailed Specifications?

(e) Explain about Task or Out-turn work.

(f) What is the difference between Contract and Tender?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

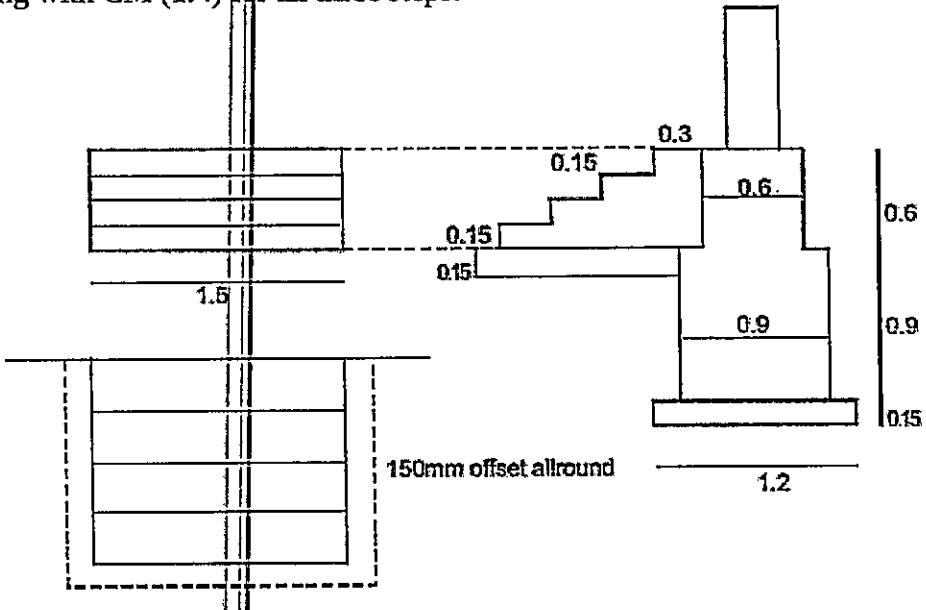
2. (a) Explain the types of Estimates with the help of Prescribed Tabular forms.

(b) Discuss the various units of measurement used for estimation of civil works.

3. (a) The section of steps at the front of a residential building is shown in figure. Calculate

i) Volume of Brick Masonry in CM (1:5) for all three steps, the length of steps is 2.1m

ii) Plastering with CM (1:4) for all three steps.



4. (a) For an embankment 90m long of uniform gradient when the height of bank is 3.45m at one end and 2.25m at the other end. The width of embankment at top is 8.3m and its side slopes 2 vertical to 1 Horizontal. Calculate the quantity of earthwork by

i) Mid Sectional area method.

ii) Mean sectional area method.

(b) What is meant by the economic depth of digging? Derive an expression to calculate it with the help of a neat sketch.

5. (a) Explain any two specifications clearly by giving suitable examples?
(b) Explain the valuation method based on profit?

6. (a) Explain the factors affecting the rate analysis?
(b) Find the rate of one cubic metre for the R.C.C work 1:2:4 as per the rate analysis.

7. (a) Explain about the following
   i) Work charged Establishment
   ii) Earnest money and Security money
   iii) Floor Area and Carpet area.
(b) Explain the approximate methods of estimating.

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CE4108

IV B.Tech I Semester Supple Examinations, March-2025

OPEN CHANNEL HYDRAULICS

(CE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) What is specific energy in open channel flow, and how is it related to the depth of flow?
   (b) What are the two numerical methods commonly used for determining the water surface profile in gradually varied flows?
   (c) Give the practical applications of hydraulic jump.
   (d) What are the uses of the draft tube?
   (e) Define priming of a pump.
   (f) Explain the features of perched aquifers.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Determine the expression for the most economical depth of water in terms of the diameter of a channel of circular cross-section for maximum discharge. **[06]**
   (b) Explain the concept of specific force in open channel flow, and discuss how it is related to specific energy and the depth of flow. Use relevant equations and diagrams to support your answer. **[06]**
3. (a) Explain the dynamic equations of gradually varied flows and the concept of hydraulic slope.
   (b) Why is a bed slope provided for an open channel? **[10]+ [02]**
4. (a) Find the rate of change of depth of water in a rectangular channel of 10m wide and 1.5m deep, when the water is flowing with a velocity of 1 m/s. The flow of water through the channel of bed slope 1 in 4000, is regulated in such a way that the energy line has a slope of 0.00004.**[06]**
   (b) Derive the relationship between conjugate depths in case of hydraulic jump on a horizontal floor. **[06]**
5. (a) What is a turbine? Can you give the classification in detail? Give the various efficiencies. **[05]**
   (b) A 1.0 m long model of a ship is towed in a towing tank at a speed of 81 cm/s. To what speed of the ship of 64 m long does this correspond? **[07]**
6. (a) Discuss the phenomena of negative slip and its effect on pump performance. **[05]**
   (b) The diameters of an impeller of a centrifugal pump at inlet and outlet are 30 cm and 60 cm respectively. Determine the minimum starting speed of the pump if it works against a head of 30 m. **[07]**
7. (a) With a neat sketch, explain Darcy's law. What are the limitations and assumptions made in Darcy's law? **[07]**
   (b) A 30 cm well penetrates 50 m below the static water table. After a long period of pumping at a rate of 1800 lpm, the drawdown in the wells at 15 and 45 m from the pumped well were 1.7 and 0.8 m respectively. Determine the transmissibility of the aquifer. **[05]**

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CE4114

IV B.Tech I Semester Supple Examinations, March-2025

PHOTOGRAMMETRY AND REMOTE SENSING

(CE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Define photo scale.
   (b) What are collinearity conditions in photogrammetry?
   (c) Define the theory of parallax in photogrammetry.
   (d) What are the basic specifications for topographic mapping?
   (e) What is absorption in the context of remote sensing?
   (f) How do across-track scanners differ from along-track scanners?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain the Overlap in Aerial Photography, Enumerate the Reasons for overlap in Aerial Photogrammetry
   (b) Explain in detail the concept of stereoscopic parallax in Aerial Photography.

3. (a) Write the difference between true vertical and tilted photograph
   (b) Describe ortho-rectification and its significance in ortho-mosaic

4. (a) Discuss on the uses of stereoscopic aerial photographs?
   (b) Write about parallax and its equations with a neat sketch

5. (a) What is Satellite? Explain the Different Types of Satellites?
   (b) Illustrate the Electro Magnetic Spectrum and its characteristics

6. (a) Explain the data Acquisition mechanism in GIS?
   (b) Describe the spectral characteristics of different types of remote sensing data?

7. (a) Define the Visual Interpretation? What are elements to be Considered during interpretation?
   (b) What is meant by image classification? Explain the Supervised Classification?

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16ME4101

IV B.Tech I Semester Supple Examinations, March-2025

FINITE ELEMENT METHODS

(ME)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Write the properties of stiffness matrix.
   (b) Show shape functions of 1-D bar element.
   (c) Mention the applications of trusses.
   (d) Discuss about 2-D four nodded isoperimetric element.
   (e) Discuss on axisymmetric formulation.
   (f) List the properties of eigen values and eigen vectors.

[2+2+2+2+2+2]

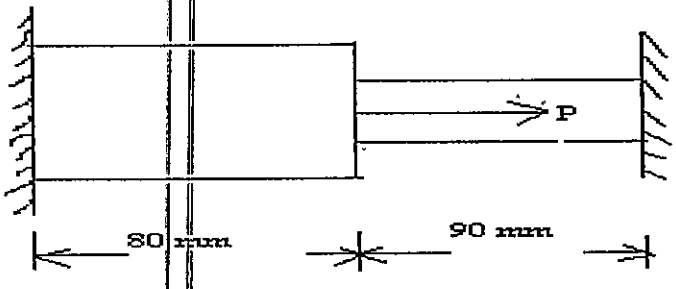
PART-B

4 X 12 = 48

2. (a) Determine ϵ_x, ϵ_y and γ_{xy} at the point x = 2, y = 1. If a displacement field is described by u = $(-2x + 3y^2 + xy)10^{-4}$ and v = $(-x^2 + 5y - y^2)\ 10^{-4}$. [6M+6M]

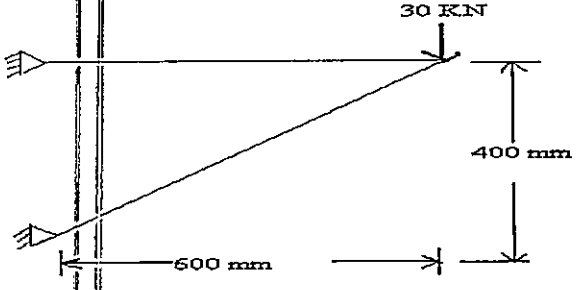
   (b) Develop the Strain Displacement (D) matrix for plane stress and plane strain conditions.

3. (a) Determine the nodal displacements and stresses for the bar shown in the figure. Take $E_1=E_2=70 \times 10^3$ N/mm^2, L_1= 80 mm, L_2= 90 mm, A_1= 900 mm^2, A_2= 400 mm^2, P = 20 KN. Use elimination approach to adopt Boundary conditions. [8M+4M]



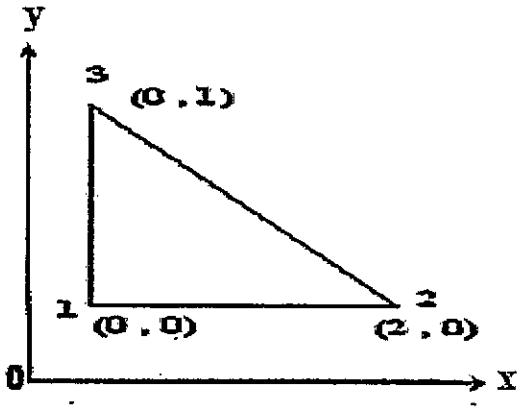
   (b) Derive Element Stiffness matrix [K] for Line Element using Potential energy approach.

4. (a) Determine Global Stiffness matrix [K] and nodal deflections for the following truss, take area of each member as 800 mm^2, E = 200 GPa. [8M]

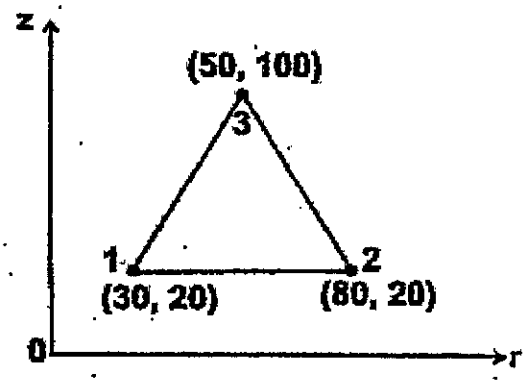


   (b) Derive load vector for Uniformly Distributed Loaded Beam. [4M]

5. (a) Determine the stiffness matrix for the element shown in figure. The coordinates are in units of mm. Assume plane stress conditions. Let E = 210 GPa, υ = 0.3, and thickness t = 20 mm.



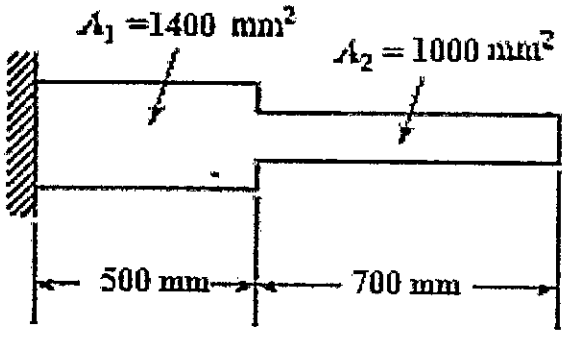
(b) Determine [B] and [D] matrices for axisymmetric element shown in figure. Assume E = 210 x 10^3 N/mm^2, Poisson's ratio υ = 0.25. The coordinates are given in millimetres. [6M+6M]



6. (a) A composite slab consists of 3 materials of different conductivities i.e. 20 W/m^{0}C, 30 W/m^{0}C, 50 W/m^{0}C of thickness 0.3 m, 0.15 m and 0.15 m respectively. The outer surface temperature is 20^{0}C and the inner surface is exposed to the convective heat transfer coefficient of 25 W/m^2 ^{0}C and T_∞= 800^{0}C. Determine the temperature distribution within the wall. [6M]

(b) Derive the stiffness matrix for 1-D conduction element. [6M]

7. (a) Determine the eigen values and eigenvectors for the stepped bar shown in figure. Take ρ = 7.830 x10^{-6} kg/mm^3 and E = 210 GPa. [8M]



(b) Derive the expression for mass matrix of a bar element. [4M]

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Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16ME4102

IV B.Tech I Semester Supple Examinations, March-2025

CAD/CAM

(ME)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Define CAD and CAM
   (b) Distinguish between Bezier and B-spline curve
   (c) Write short notes on layers
   (d) Expand NC, CNC and DNC
   (e) Name two coding systems
   (f) List out benefits of CIM

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain Computer Aided product cycle with neat sketch [8M]

   (b) Elaborate different transformations used in computer graphics [4M]

3. (a) Distinguish between (i) parametric and non-parametric representation of curves [6M]
   (ii) B-rep and C -rep

   (b) Elucidate various surfaces used in geometric modelling [6M]

4. (a) List out various commands used in Drafting and Modelling. Explain any one type [8M]

   (b) Brief about sweep representation and enumerate its types [4M]

5. (a) Distinguish between manual and computer aided part programming. Discuss any one [8M]

   (b) What are the applications of numerical controls? [4M]

6. (a) Brief about Optiz classification system [6M]

   (b) List out the benefits of GT [6M]

7. (a) Explain types of computer aided process planning [6M]

   (b) Discuss non contact inspection methods. Explain Machine Vision technique [6M]

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16ME4103

IV B.Tech I Semester Supple Examinations, March-2025

ADVANCED MANUFACTURING PROCESSES

(ME)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Explain Stir casting process.
   (b) What are the advantages and applications of LBW?
   (c) What are the limitations of high velocity forming process?
   (d) Explain Abrasive water jet machining process.
   (e) What are the economic considerations in electrochemical process?
   (f) What is the purpose of deflection coil in EBM process?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain Squeeze casting process with neat sketch. [6M]
   (b) Write short notes on ceramic shell casting and list out various applications. [6M]

3. (a) Distinguish between EBW and LBW [4M]
   (b) Construct and Explain working principle of electron beam welding process with neat sketch and their advantages, disadvantages. [8M]

4. (a) Describe the basic principle behind magnetic forming. [4M]
   (b) What are some key design considerations when designing parts for forming processes? How does material selection affect the design for forming? [8M]

5. (a) Construct and explain abrasive machining process. List out any two applications. [6M]
   (b) What are the advantages, limitations and applications of Water jet machining? [6M]

6. (a) Explain the significance of the material removal rate (MRR) in machining processes [4M]
   (b) What are the main components involved in an electro-spark machining setup? What factors can affect the MRR in electro-spark machining? What are some common applications of electro-spark machining? [8M]

7. A laser beam with a power intensity of 2*10^5 w/square-mm is used to drill a 0.25 mm diameter through hole in a tungsten sheet of thickness 0.5 mm. If the efficiency of the operation is only 10 % and 3*10^4 J/cubic-cm are required to vaporize the tungsten, Estimate the time required. [12M]

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16ME4104

IV B.Tech I Semester Supple Examinations, March-2025

POWER PLANT ENGINEERING

(ME)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) List the processes in the Rankine cycle.
   (b) Discuss the advantages of steam boilers
   (c) Distinguish between forced draft and induced draft.
   (d)What is fission reaction and how it is used for power generation?
   (e) Write some main components of gas turbine plant.
   (f) Illustrate different methods of finding operating cost of a power plant.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Write the classification of hydro power plants. [6M]
   (b) Differentiate between reheating and regeneration techniques. [6M]

3. (a) Explain the working principle of Fluidized bed boilers. [6M]
   (b) What are advantages of feed water circulation and cooling tower in steam power plant? [6M]

4. (a) Explain coal handling system methods used in thermal power plants. [6M]
   (b) Illustrate with neat sketch working of electrostatic precipitator. [6M]

5. (a) Explain the working principle of closed cycle gas power plant with neat sketch. [6M]
   (b) Discuss with neat sketches working of Pressurized Heavy water reactor. [6M]

6. (a) Explain the working principle of Diesel power plant, what are the methods used to meet the power requirements during peak load operation? [6M]
   (b) Explain different methods of governing the turbines. [6M]

7. (a) Explain with neat diagram the load duration curve [6M]
   (b) Explain the Energy auditing in power plants. [6M]

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16ME4111

IV B.Tech I Semester Supple Examinations, March-2025

PRODUCTION PLANNING AND CONTROL

(ME)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) How does production planning differ from production control?
   (b) How does Regression Analysis help in forecasting?
   (c) What is the Just-In-Time (JIT) inventory system, and what are its benefits?
   (d) What do you understand by Bill of Materials?
   (e) How is the Gantt Chart used in production scheduling, and what are its benefits?
   (f) What are the primary responsibilities of a dispatcher in a manufacturing setting?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain the important characteristics of batch production 6M
   (b) Explain the organization chart of PPC department 6M
3. (a) One of the two wheeler manufacturing company experienced irregular but usually increasing demand for three products. The demand was found to be 420 bikes for June and 440 bikes for July. They use a forecasting method which takes average of past year to forecast future demand. Using the simple average method demand forecast for June is found as 320 bikes (Use a smoothing coefficient 0.7 to weight the recent demand most heavily) and find the demand forecast for August 8M
   (b) How should a company include information for their forecast that indicates the economy is headed for a recession? How, if at all, should that information impact time-series forecasting information? 4M
4. (a) ABC manufacturers produces 1,25,000 oil seals each year to satisfy the requirement of their client. They order the metal for the bushing in lot of 30,000 units. It cost them Rs.35000 to place the order. The unit cost of bushing is Rs.100 and the estimated carrying cost is 25% unit cost. Find out the economic order quantity? What percentage of increases or decrease in order quantity is required so that the ordered quantity is Economic order quantity? 8M
   (b) Describe the objectives of MRP 4M
5. (a) Explain the routing procedure 6M
   (b) Write a short on essential elements of BOM 6M
6. (a) Explain the scheduling procedure with suitable example. Discuss in detail about the scheduling rules 8M
   (b) Discuss about flow production scheduling 4M
7. (a) Explain dispatching procedure 6M
   (b) Discuss about follow-up documents 6M

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EC4102

IV B.Tech I Semester Supple Examinations, March-2025

MICROCONTROLLERS AND EMBEDDED SYSTEMS

(ECE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) List out basic features of 8051 microcontroller.
   (b) Draw the diagram of keyboard interfacing with 8051 microcontroller.
   (c) List ARM processor families.
   (d) List major application areas of embedded systems.
   (e) Expand the abbreviations USB and I2C.
   (f) Write any two differences between kernel and real-time kernel.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain internal RAM and ROM organization of 8051 microcontroller. [6]
   (b) Explain addressing modes of 8051 microcontroller. [6]

3. (a) Explain ADC interfacing with 8051 microcontroller with a neat diagram. [6]
   (b) Explain Opto isolators and sensor interfacing with 8051 microcontroller. [6]

4. (a) Explain function of on-chip peripherals of ARM processor. [6]
   (b) Discuss ARM Thumb programming model. [6]

5. (a) Compare embedded systems and general computing systems. [6]
   (b) Explain different quality attributes of embedded systems. [6]

6. (a) Explain watchdog timer and brown-out protection circuit. [6]
   (b) Explain various embedded firmware development languages. [6]

7. (a) Explain Task, Process and Thread with respect to an operating system. [6]
   (b) Explain FIFO process scheduling algorithm with an example. [6]

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EC4110

IV B.Tech I Semester Supple Examinations, March-2025

RADAR SYSTEMS

(ECE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Describe the radar range equation.
   (b) List out the disadvantages of CW Radars.
   (c) Differentiate MTI Radar and Pulse Doppler radar.
   (d) Compare and contrast various Tracking Radar systems.
   (e) Mention the advantages and disadvantages of Parabolic Reflector Antennas.
   (f) Classify the Duplexers.

[2+2+2+2+2+2]

PART-B

4 × 12 = 48

2. (a) Explain their qualitative effects on radar performance, including sensitivity, resolution, and maximum detectable range.
   (b) Derive expression for radar range equation

3. Draw block diagram of a basic CW radar system and explain the function of each block.

4. (a) Scenario: A radar designer comparing two radar systems for an air traffic control application. One is an MTI radar, and the other is a Pulse Doppler radar. You need to assess their performance in tracking fast-moving aircraft.
   Compare the performance parameters of the Raytheon AN/APG-82(V)1 MTI radar versus the Northrop Grumman AN/APG-79 Pulse Doppler radar in detecting and tracking fast-moving targets. Discuss the limitations of the MTI radar in comparison.
   (b) A Pulse Doppler radar system is tasked with detecting a fast-moving aircraft with a radar cross-section of 3 m^2 at a frequency of 10 GHz. The radar has a transmitted power of 2 kW, an antenna gain of 35 dB, a system loss of 15 dB, and a minimum detectable signal of 2×10^{-10}W. Calculate Maximum range (Rmax) with the following parameters
   - Transmitted power (Pt): 2 kW
   - Antenna gain (G): 35 dB (or a linear gain of 3162)
   - Frequency (f): 10 GHz (wavelength $\lambda = 0.03$ m)
   - Target radar cross-section (σ): 3 m^2
   - System losses (L): 15 dB (or a linear loss factor of 31.62)
   - Minimum detectable signal (Smin): 2×10^{-10}W.

5. (a) Explain the principles behind Amplitude Comparison Monopulse and Phase Comparison Monopulse radar tracking techniques. How does each technique determine the angular position of a target?

(b) A radar system using sequential lobing has three lobes with an angular separation of 5^0 between each lobe. If the radar system operates at a pulse repetition frequency (PRF) of 1 kHz and the range to the target is 100 km, calculate the maximum angular tracking rate the system can achieve.

6. (a) Describe the Principle of Operation of Lens Antenna.

(b) Given a radar system utilizing a Matched Filter Receiver, describe how to derive the filter's impulse response based on a known transmitted signal waveform. Explain the steps involved in deriving the filter and how it would be implemented in the receiver system.

7. Classify duplexers used in radar communications and explain them

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC41OE7

IV B.Tech I Semester Supple Examinations, March-2025

INTERNET OF THINGS (IOT) (OPEN ELECTIVE-II)

(EEE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Define IOT.
   (b) What is the importance of domain model specification in IoT design methodology?
   (c) What is System on Chip?
   (d) Give one difference between Raspberry Pi and Beagle Bone Black Board.
   (e) What is WAMP?
   (f) Define Smart City.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Discuss applications and characteristics of IoT.
   (b) Explain logical design of IoT.

3. (a) Explain IoT design methodology for home automation system.
   (b) Make use of case study on Smart City, explain service, IoT level, functional view and operational view specifications.

4. (a) Discuss various embedded computing devices.
   (b) Explain application development in Arduino.

5. (a) Demonstrate any one application with Raspberry Pi.
   (b) Explain developing (operating system, programming language and debugging) on the Raspberry PI.

6. (a) Explain the role of Cloud Computing in IoT.
   (b) Explain the use of AutoBahn and Xively Cloud for IoT.

7. (a) Explain in detail the application of IoT in Agriculture.
   (b) Discuss IoT in home automation.

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC41OE14

IV B.Tech I Semester Supple Examinations, March-2025

ROBOTICS (OPEN ELECTIVE-III)

(ME)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) State the difference between programmable automation and fixed automation.
   (b) What are steeper motors?
   (c) List the robot application for spray painting.
   (d) Differentiate forward and inverse kinematics.
   (e) Lists the applications of Lagrange – Euler formulations.
   (f) Explain the Skew motion.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2 (a) Explain the basic components of a robot system with the help of a line diagram. [6]

(b) Define Robotics, & explain the importance of robotics in automation. [6]

3 (a) Explain in detail about velocity sensors. [6]

(b) List the different types of actuators used for robots and briefly explain any one. [6]

4 (a) Discuss the role of robot in arc welding. [6]

(b) Explain the applications of robots in assembly and inspection. [6]

5 (a) Explain about Homogeneous Transformations in robotics kinematics. [6]

(b) State the important steps in the Denavit-Hartenberg (D-H) convention. [6]

6 Explain about Newton – Euler formulations by considering suitable example. [12]

7 (a) Discuss the textural robot language structure with the help of block diagram. [6]

(b) Explain the following [6]
i) Potentiometers ii) Velocity sensors

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Narasaraopeta Engineering College (Autonomous)

KotappakondaRoad, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC41OE22

IV B.Tech I Semester Supple Examinations, March-2025

WATER SHED MANAGEMENT (OPEN ELECTIVE-III)

(CE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a)What is the function of a watershed?

   (b)Mention the different methods of geometric representation of watersheds.

   (c)What are the effects of erosion on land fertility?

   (d)Give the difference between dam and check dam.

   (e)Write a short note on Reclamation of saline and alkaline soils.

   (f)Define the conceptual models in watershed management.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2.Explain in detail about the integrated watershed management approach.

3. (a) Give a brief explanation on hydrology and socio-economic characteristics of watershed.

   (b) Write a short note on Watershed delineation. [6+6]

4. (a)List out the climatic factors that influence the Erosion.

   (b)Explain in detail various erosion control measures. [6+6]

5.What are harvesting structures? Explain any three in detail with figures?

6. Explain land use and land capability. List out the different objectives of land capability classification. Explain in detail about the classification of land capability?

7.Discuss the applications of remote sensing and Geographical Information System in watershed management.

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