AR18

CODE: 18MEE451   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, March-2023
AUTOMATION IN MANUFACTURING
(Mechanical Engineering)

Time: 3 Hours   **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.		Explain all the strategies in automating a manufacturing plant.	12 M
		(OR)	
2.	a)	Explain any two layouts used in automation.	6 M
	b)	Describe programmable, flexible and fixed automation systems with suitable examples.	6 M

UNIT-II

3.	a)	Enlist various objectives of transfer lines.	4 M
	b)	Enlist various linear and rotary mechanisms incorporated in transfer lines.	8 M
		(OR)	
4.	a)	Explain about upper and lower boundary approach w.r.t transfer lines.	4 M
	b)	A Geneva mechanism is used in a rotary work table with eight stations. If the cycle time is 1.5 minutes, find the indexing time and station service time.	8 M

UNIT-III

5.	a)	Explain the process of Kilbridge and Wester Method of line balancing with suitable example.	6 M
	b)	Discuss the terms precedence constraints, work content time and network diagram in a line balancing problem.	6 M
		(OR)	
6.	a)	Write a short note on manual and automated assembly systems.	6 M
	b)	Enlist and explain various configurations of automated assembly systems.	6 M

UNIT-IV

7.	a)	Enlist various material handling systems with short note about each.	6 M
	b)	With neat sketches explain about Skate-Wheel, cart-on-track, power and free overhead trolley type conveyors.	6 M
		(OR)	
8.	a)	Give the applications of Automated guided vehicle in production domain.	6 M
	b)	Give a short note on various Storage systems along with its applications.	6 M

UNIT-V

9.	a)	Describe how waste is eliminated in Lean manufacturing.	6 M
	b)	Explain the principles of Agile manufacturing.	6 M
		(OR)	
10.	a)	Enlist various CMMs with their applications.	6 M
	b)	Explain about image segmentation in machine vision.	6 M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, March-2023
MANAGERIAL ECONOMICS AND MANAGEMET SCIENCE
(Civil Engineering)

Time: 3 Hours   **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain how do you measure elasticity of demand.	6 M
	b)	What is demand function? How do you determine it.	6 M

(OR)

2.	a)	How do you interpret the different types of elasticity?	6 M
	b)	Differentiate extension in demand and increase in demand. Illustrate.	6 M

UNIT-II

3.	a)	Explain how cost-output relationship helps the entrepreneurs in expansion decisions.	6 M
	b)	Discuss the significance of Break-even analysis.	6 M

(OR)

4.	a)	Explain the laws of returns with appropriate examples.	6 M
	b)	Discuss the different cost concepts used in the process of cost analysis.	6 M

UNIT-III

5.	a)	How price and output is determined under Monopoly and Monopolistic competition for in short run?	6 M
	b)	How different methods of pricing is useful for fixing price for existing and new products depending on Product Life Cycle Stages and Business Cycle stages?	6 M

(OR)

6.	a)	Differentiate features of Perfect competition, Monopoly and Monopolistic Markets?	6 M
	b)	Explain the Cost-Volume profit analysis role in Business decision.	6 M

UNIT-IV

7.	a)	Explain Hertzberg's Two Factor Theory of Motivation.	6 M
	b)	Discuss the various types of organization structures.	6 M

(OR)

8.	a)	Define Management. Describe functions of Management.	6 M
	b)	Explain process of Decision Making.	6 M

UNIT-V

9.	a)	Describe various functions of HR Manager.	6 M
	b)	What do you mean by marketing? Explain various functions of Marketing.	6 M

(OR)

10.	a)	Suggest various strategies based on various phases of Product Life Cycle.	6 M
	b)	What is Merit Rating? How it is useful for Job Evaluation.	6 M

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CODE: 18EEE451   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, March,2023
UTILIZATION OF ELECTRICAL ENERGY
(Electrical and Electronics Engineering)

Time: 3 Hours   **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Derive an equation for the Cooling time constant of a motor from the fundamentals.	6M
	b)	Classify different types of electric drives and write their applications.	6M

(OR)

2.	a)	Explain the concept of Load equalization with respect to electric drives.	6M
	b)	Discuss the advantages and disadvantages of electric drive over other drives.	6M

UNIT-II

3.	a)	What are the different types of heating? Write advantages of electric heating?	6M
	b)	Describe the Coreless type Induction Furnace with neat diagram and state its advantages.	6M

(OR)

4.	a)	Explain the principle of operation of electric arc welding.	6M
	b)	Compare the AC and DC systems of welding methods.	6M

UNIT-III

5.	a)	Two arc lamps of 1000 C.P. and 500 C.P. respectively are suspended 15 meters above the ground level and are 30 m apart. Find the intensity of illumination at a point on the ground in line with two lamps and 15 meters from the base of the more powerful lamp.	6M
	b)	Explain with sketches the constructional features of a filament lamp.	6M

(OR)

6.	a)	State and explain laws of Illumination?	6M
	b)	With a neat diagram, explain the construction and working of Mercury Vapour Lamp.	6M

UNIT-IV

7.	a)	For a quadrilateral speed-time curve of an electric train, derive expression for the distance between stops and speed at the end of the coasting period.	6M
	b)	Explain the terms average speed and schedule speed of a speed time curve.	

(OR)

8.	a)	A train runs with an average speed of 40 kmph. Distance between stations is 2 km. Values of acceleration and retardation are 1.5 kmphps and 2.5 kmphps respectively. Find the maximum speed of train assuming trapezoidal speed – time curve.	6M
	b)	Discuss the merits and demerits of the D.C and 1-Φ A.C systems for the line electrification of the railways.	6M

UNIT-V

9.	a)	Explain and derive the expression for the specific energy consumption for given run.	6M
	b)	Explain the terms Adhesive weight and Coefficient of adhesion.	6M

(OR)

10.	a)	What are the various factors that effecting the specific energy consumption?	6M
	b)	A train with an electric locomotive weighing 300 tonnes is to be accelerated up a gradient of 1 in 33 at acceleration of 1 kmphps. If the train resistance, coefficient of adhesion and effect of rotational inertia are 80 newton per tonne, 0.25 and 12.5 percent of the dead weight respectively. Determine the minimum adhesive weight of the locomotive.	6M

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Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain in brief about evolution of GPS	6M
	b)	Explain the process of identifying the receiver position in 2D and 3D?	6M

(OR)

2.	With neat diagram explain the working principle of GPS	12M

UNIT-II

3.	a)	Give the various segments involved in GPs with brief explanation	6M
	b)	Explain in brief about position determination using PRN codes	6M

(OR)

4.	a)	Summarize the characteristics of C/A code	6M
	b)	Draw the signal structure of GPS and explain in brief	6M

UNIT-III

5.	Explain different types of coordinate systems	12M

(OR)

6.	a)	Explain the need of WGS 84 system in GPS position computation	6M
	b)	Give the details of conversion between Cartesian and geodetic coordinate frame	6M

UNIT-IV

7.	a)	Explain the RINEX format of observation and navigation data files	6M
	b)	Give the orbital parameters in GPS	6M

(OR)

8.	Describe the steps involved in receiver position estimation using Lease Squares Approximation method	12M

UNIT-V

9.	Explain in detail about different error sources in GPS	12M

(OR)

10.	a)	Give the details of ionospheric error?	6M
	b)	Explain the need of dual frequency GPS receiver	6M

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Time: 3 Hours   Max Marks: 60

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Derive the simple radar range equation in terms of minimum detectable signal to noise ratio (S/N)min	8M
	b)	Discuss about Radar frequencies	4M

(OR)

2.	a)	A marine radar operating at 10GHz has a maximum range of 60km with an antenna gain of 4000. The transmitter has a power of 200KW and Smin of 10-12 W. Determine the cross section of the target the radar can sight.	6M
	b)	List out some important applications of a radar system.	6M

UNIT-II

3.	a)	Explain the principle of operation FM –CW altimeter with suitable diagrams	6M
	b)	Mention the unwanted signals in FM altimeter	6M

(OR)

4.	a)	Describe the operation of multiple-frequency CW radar	6M
	b)	Explain FMCW radar with necessary diagrams	6M

UNIT-III

5.	a)	Write about delay line canceller	8M
	b)	Discuss about blind speeds.	4M

(OR)

6.	a)	Explain of MTI radar with necessary diagrams	6M
	b)	Explain the Butterfly effect that is produced by MTI.	6M

UNIT-IV

7.	a)	Explain sequential lobing	6M
	b)	Explain in detail about the limitations to tracking accuracy	6M

(OR)

8.	a)	Explain conical scanning method	6M
	b)	Explain low angle tracking	6M

UNIT-V

9.	a)	Explain the principle and characteristics of a matched filter	6M
	b)	Derive the expression for matched filter frequency response function.	6M

(OR)

10.	a)	Explain Branch type duplexer	6M
	b)	Describe briefly various visual displays to view radar echo signals in radar systems.	6M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, March-2023
AD-HOC AND SENSOR NETWORKS
(Common to CSE & IT)

Time: 3 Hours   **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) What are the differences between Cellular and Ad Hoc networks?   8M
   b) Describe the important characteristics of a MANET.   4M

(OR)

2. a) What are the major challenges a routing protocol faces in Ad Hoc networks?   6M
   b) Write in detail about any two applications of Ad Hoc Networks.   6M

UNIT-II

3. a) Write in detail the Hidden and Exposed terminal problems with a diagram.   6M
   b) What problems in the MACA protocol lead to the MACAW protocol?   6M

(OR)

4. a) Describe the frame format in the CATA protocol.   6M
   b) Write in detail about packet exchange in Distributed Priority Scheduling for Ad Hoc Networks.   6M

UNIT-III

5. a) Write in detail about route establishment in DSDV with necessary diagrams.   6M
   b) What are the advantages and disadvantages of the AODV protocol? Draw a diagram for route maintenance in AODV.   6M

(OR)

6. a) Describe the mobility, bandwidth and resource constraint issues for designing a routing protocol for Ad Hoc wireless networks.   6M
   b) Write in detail about route establishment in CEDAR.   6M

UNIT-IV

7. a) Write in detail about Clustered sensor network architecture with a diagram.   6M
   b) Describe any six challenges in designing a sensor network.   6M

(OR)

8. a) What are different types of sensors in a sensor network? Show the classification of sensor network protocols.   6M
   b) How are sensor networks different from Ad Hoc wireless networks?   6M

UNIT-V

9. a) Write in detail about hybrid TDMA and FDMA protocols for sensor networks.   6M
   b) What is the difference between indoor localization and sensor network localization?   6M

(OR)

10. a) Describe atomic ML and a directionality-based localization approaches for Sensor Network localization.   6M
    b) What are the various attacks on sensor networks?   6M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Supplementary Examinations, March-2023
UTILIZATION OF ELECTRICAL ENERGY
(Electrical and Electronics Engineering)

Time: 3 Hours   Max Marks: 70

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) What do you understand by load equalization? 7M
    b) Give the factors to be considered for choice of motor. 7M

(OR)

2. a) Define heating and cooling time constants. Define terms continuous rating and short time rating. 8M
    b) Write short notes on energy star rating of equipment. 6M

UNIT-II

3. a) Write short notes on dielectric heating and list out some of the applications. 7M
    b) Explain working of indirect resistance heating with neat diagram and explain its applications. 7M

(OR)

4. a) Give electric welding accessories to carry out proper welding operation. 6M
    b) Explain the working of upset butt welding with neat diagram. Give applications 8M

UNIT-III

5. a) Discuss inverse square law and Lambert's cosine law of illumination. 8M
    b) Two similar lamps having luminous intensity of 600 CP in all directions below horizontal are mounted at a height of 10m. What must be the spacing between the lamps so that the illumination on the ground midway between the lamps shall be at least one-half of the illumination directly below the lamp? 6M

(OR)

6. a) Describe the construction and working of a fluorescent tube lamp. 7M
    b) Explain the construction and working of mercury vapour discharge lamp. 7M

UNIT-IV

7. a) Draw and explain any one type of typical speed-time curve for an electric traction. 8M
    b) An electric train is to have the acceleration and braking retardation of 0.6 kmphps and 3 kmphps respectively. If the ratio of the maximum speed to average speed is 1.3 and time for stop is 25 seconds. Determine the schedule speed for a run of 1.6 Km. Assume the simplified trapezoidal speed-time curve. 6M

(OR)

8. a) Briefly discuss the special design features of traction motors? 6M
    b) Explain in detail the mechanics of train movement 8M

UNIT-V

9. a) Define the specific energy consumption. Explain the factors affecting the specific energy consumption. 7M
    b) Write short notes on tractive effort required to overcome the effect of gravity. 7M

(OR)

10. a) Write short notes on tractive effort required for linear and angular acceleration. 7M
    b) A train with an electric locomotive weighing 380 tonnes is to be accelerated up a gradient of 1 in 100 at an acceleration of 1 kmphps. If the train resistance is 75 N/tonne, coefficient of adhesion is 0.28 and effect of rotational inertia is 15% of the dead weight. Calculate the minimum adhesive weight of the train. 7M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular/Supplementary Examinations, March,2023
TRANSPORTATION ENGINEERING-II
(Civil Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Draw a neat cross section of permanent way and explain its component parts — 7 Marks
   b) Explain wave theory and percussion theory related to creep — 7 Marks

(OR)

2. Bring out comparison between various ballast materials in terms of advantages ,disadvantages and suitability of various ballast materials — 14 Marks

UNIT-II

3. a) Calculate the maximum permissible speed on a curve of high speed for the following data on a B.G track. Degree of curve 1.2^o, amount of super elevation 8.0 cm, length of transition curve 125 m, maximum speed of the section likely sanction speed = 150 kmph — 7 Marks
   b) Derive an expression to establish relationship among gauge, speed, radius of curvature and super elevation — 7 Marks

(OR)

4. a) Write in detail about various gradients used on a railway track along with minimum values of each gradient. — 7 Marks

   b) Write a short notes on the following a) grade compensation b) Negative super elevation c) provision of check rails on curves — 7 Marks

UNIT-III

5. a) Draw a neat labelled sketch of left hand turn out and explain its component parts — 7 Marks
   b) Write a short note on the following with neat sketch — 7 Marks
      a) Fixed signals   b) Stop signal

(OR)

6. a) Write a short notes on the following a)Heel clearance or Heel divergence b) Flange way clearance c) Switch angle d) Flare — 7 Marks
   b) Write a short notes on the following a) Under cut Switches b) Over riding switches c) Straight cut switches — 7 Marks

UNIT-IV

7. a) Explain in detail various factors affecting site Selection of Airport — 7 Marks
   b) Write a detailed note on runway lightning system with neat sketch — 7 Marks

(OR)

8. a) Explain various corrections that are applied for a basic run way length in case of an airport. — 7 Marks
   b) Explain type 1 wind rose diagram with a neat sketch — 7 Marks

UNIT-V

9. a) Define port. Write a detailed note on requirements of a good port — 6 Marks
   b) Write a detailed note on classification of harbours based on various criteria — 8Marks

(OR)

10. a) Explain in detail the working principle of light house with a neat sketch — 8 Marks
    b) Define break water. Explain any one type — 6 Marks