

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-IMarks CO Blooms
Level

1. a) Calculate the fire demand for a city of population (i) 2 lakhs and (ii) 5 lakhs, by using different formulae including formula of BIS. 6 1 3
- b) Compare the quality and quantity of various Ground and Surface water sources. 4 1 2

(OR)

2. a) The population of a town as obtained from the census report is as follows Estimate the population of the town as in 1981, 1991 and 2000 and 2001 by Geometrical Increase Method 5 1 3

Year	1901	1911	1921	1931	1941	1951	1961
population	24831	25293	25493	27263	38284	49909	67105

- b) For the above data, find out the population of the town in 1981, 1991 and 2000 and 2001 by Arithmetical Increase Method 5 1 3

UNIT-II

3. a) Describe the process of Coagulation with Iron salts Vs. Coagulation with Alum, with equations. 5 2 2
- b) Write the difference between slow and rapid sand filters. 5 2 3

(OR)

4. a) Explain how 'Optimum Coagulant Dose' is found on a particular day for a Water Treatment Plant. 5 2 2
- b) If a chlorine dosage of 0.6 ppm is necessary to leave a residue of 0.2 ppm, find the chlorine demand for a flow of 5 MLD. 5 2 3

UNIT-III

5. a) Explain how the Hardy-Cross method is applied for balancing the heads with assumed flows in water distribution network 5 3 2
- b) Write about a) Air valves b) Check valves c) Scour valves d) Pressure relief valves with neat sketches. 5 3 3

(OR)

6. a) What do you understand by an equivalent pipe? How do you determine its length when the pipes are (i) in series (ii) in parallel. 5 3 2
- b) Illustrate with sketch the Grid iron type of layout of pipe system in distributing water, and compare its merits and demerits. 5 3 2

UNIT-IV

7. a) Why a circular section is more commonly used in the construction of sewers? 4 4 2
- b) Given a waste water containing 300 mg/l of a ketone of chemical formula $\text{CH}_3\text{COC}_2\text{H}_5$. 6 4 3
- i. Calculate the COD
- ii. Assume a k value (base 10) of 0.1 per day Calculate the ultimate BOD and the 5 day BOD of the waste. Note: H = 1 ; C = 12, O = 16.
- (OR)**
8. a) What are the advantages of the egg-shaped section, and under what conditions of flow, does it become more useful? Will you recommend its use for sanitary sewers, and if not, why? 6 4 2
- b) Design a sanitary sewer with the following data: i. Population served = 25,000 ii. Expected sewage flow = 135 lpcd (average) iii. Average slope of the ground = 1 in 500 4 4 3

UNIT-V

9. a) With the help of a sketch explain the working of a slow rate trickling filter. 5 5 2
- b) A sedimentation tank treats 8 m³/d containing 240 mg/l of suspended solids. The tank removes 65% of the suspended solids. Compute the weight and volume of the sludge produced yearly if the moisture content is (a) 97% (b) 94% 5 5 3
- (OR)**
10. a) Draw the layout and general outline of various units in waste water treatment plant with their functions. 5 5 3
- b) Discuss in brief various design parameters used for septic tanks 5 5 2

UNIT-VI

11. a) What are the various effects of Noise Pollution? 5 6 1
- b) What are the advantages and disadvantages of with bag filters? 5 6 2
- (OR)**
12. a) What are the various secondary air pollutants and how they are formed 5 6 1
- b) What is the principle of Cyclone Separators? What are the limitations of Cyclone Separators? 5 6 2

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

		Marks	CO	Blooms Level
<u>UNIT-I</u>				
1.	a) Describe the TCP/IP Reference model in detail.	5	CO 1	K1
	b) What is the significance of layered architecture? Explain the OSI layered architecture with neat sketch	5	CO 1	K2
(OR)				
2.	a) Differentiate OSI reference model with the TCP/IP reference model.	5	CO 1	K3
	b) Explain the limitations of ARPANET	5	CO 1	K1
<u>UNIT-II</u>				
3.	a) What is the window size of sender and receiver sides in selective repeat protocol? Explain with timing diagram.	5	CO 2	K2
	b) What is a frame and explain different framing methods	5	CO 2	K2
(OR)				
4.	a) Discusses the concept of redundancy in error detection	5	CO 2	K1
	b) Explain CRC error detection method	5	CO 2	K1
<u>UNIT-III</u>				
5.	a) Write about CSMA and CSMA/CD in detail.	5	CO 3	K1
	b) What are the different channel allocation problems in Medium Access control sub layer	5	CO 3	K2
(OR)				
6.	a) List out the situations in which pure ALOHA and slotted ALOHA performs better. Justify your answer	5	CO 3	K2
	b) Explain any one collision free protocol.	5	CO 3	K3
<u>UNIT-IV</u>				
7.	a) What is the significance of The Network layer in the ATM networks?	5	CO 4	K2
	b) Explain shortest path routing algorithm with an example	5	CO 4	K2
(OR)				
8.	a) What are the General Principles of Congestion prevention policies?	5	CO 4	K2
	b) Explain Hierarchical routing algorithm with an example	5	CO 4	K2
<u>UNIT-V</u>				
9.	a) What are the different services provided by transport layer?	5	CO 5	K2
	b) How a Connection is established in a Transport Protocol. Explain three protocol scenarios for establishing a connection	5	CO 5	K2
(OR)				
10.	a) Discuss in detail about the connection establishment and release in TCP.	5	CO 5	K2
	b) Explain TCP Connection management Finite State Machine. Explain all states in it.	5	CO 5	K2
<u>UNIT-VI</u>				
11.	a) What is HTTP? Discuss static web document and dynamic web document	5	CO 6	K2
	b) What are the protocols associated with WWW. Explain them.	5	CO 6	K2
(OR)				
12.	a) What is DNS? What resource records are associated with it? Explain	5	CO 6	K2
	b) What are the five basic functions supported in e-mail systems? Explain.	5	CO 6	K2

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

	<u>UNIT-I</u>	Marks	CO	Blooms Level
1.	a) Explain about current distribution on a two wire antenna.	5M	CO1	Understand
	b) Using basic equations, prove that R_{rad} of a half wave dipole is 73Ω ?	5M	CO1	Analyse
	(OR)			
2.	a) Define basic antenna parameters and explain them.	5M	CO1	Remember
	b) Find the radiation resistance of a loop antenna (i) single turn (ii) Number of turns =10 of diameter 0.5 m and operating at 1 MHz .	5M	CO1	Analyse
	<u>UNIT-II</u>			
3.	a) Explain in detail about Broadside arrays in detail.	5M	CO2	Understand
	b) Explain the principle of Pattern multiplication.	5M	CO2	Understand
	(OR)			
4.	a) What is broadside array and derive the expression for angles of nulls, maxima and half power points?	5M	CO2	Analyse
	b) Write short notes on: i) Phased arrays ii) Binomial arrays	5M	CO2	Remember
	<u>UNIT-III</u>			
5.	a) Explain the different modes of operation of helical antenna in detail.	5M	CO3	Understand
	b) What are the advantages of Rhombic antenna over a single wire antenna? Explain the operation of Rhombic antenna.	5M	CO3	Remember
	(OR)			
6.	a) Explain the working of Yagi-Uda antenna.	5M	CO3	Understand
	b) Explain the principle of operation and applications of folded dipoles.	5M	CO3	Analyse
	<u>UNIT-IV</u>			
7.	a) Classify lens Antenna? Explain the working principle?	5M	CO4	Remember
	b) Explain the designing and working principle of a parabolic antenna	5M	CO4	Understand
	(OR)			
8.	a) Explain the working principle of Microstrip antenna	5M	CO4	Understand
	b) Classify the corner reflector antenna and explain the working of any one of the antenna?	5M	CO4	Remember
	<u>UNIT-V</u>			
9.	a) Derive the expression for free space wave equation.	5M	CO5	Understand
	b) Define i) Critical frequency ii) Skip distance with relevant expressions.	5M	CO5	Analyse

(OR)

- | | | | | | |
|-----------------------|----|--|----|-----|------------|
| 10. | a) | Explain Maximum Usable Frequency and show how to Calculate MUF | 5M | CO5 | Understand |
| | b) | Explain Ground Wave Propagation in detail | 5M | CO5 | Understand |
| <u>UNIT-VI</u> | | | | | |
| 11. | a) | Derive the expression for effective earth radius. | 5M | CO6 | Analyse |
| | b) | Explain the Tropospheric wave Propagation. | 5M | CO6 | Understand |
| (OR) | | | | | |
| 12. | a) | Describe the directivity measurements of an antenna. | 5M | CO6 | Understand |
| | b) | Explain the procedure of antenna gain measurement. | 5M | CO6 | Analyse |

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

Answer ONE Question from each Unit

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<u>UNIT-I</u>		Marks	CO	Blooms Level
1.	a) Draw the V-I characteristics of SCR and explain it briefly?	5	CO1	2
	b) Describe the basic behavior of thyristor using a two-transistor model	5	CO1	2
(OR)				
2.	a) Draw the V-I characteristics of power IGBT and explain it briefly?	5	CO1	2
	b) What are the different turning-on methods of a thyristor? Explain each method.	5	CO1	2
<u>UNIT-II</u>				
3.	Explain the operation of a single-phase half-controlled rectifier with RL load and freewheeling diode. Derive the expression for average DC output voltage. Draw the relevant waveforms	10	CO2	2
(OR)				
4.	a) A single phase 220 V, 1 kW heater is connected to a half-wave controlled rectifier and fed from a 220 V, 50 Hz AC supply, Determine the power absorbed by the heater when the firing angle is i) $\alpha = 60^\circ$ and ii) $\alpha = 90^\circ$	6	CO2	3
	b) Explain how a free-wheeling diode improves the power factor in a single phase semi converter.	4	CO2	2
<u>UNIT-III</u>				
5.	Explain the operation of single – phase bridge rectifier with RL loads for firing angle of 30° if the supply frequency is 50Hz. Derive the expression for average dc output voltage. Draw the relevant waveforms	10	CO3	3
(OR)				
6.	a) A single phase fully controlled bridge converter with RL load is supplied from 220 V, 50 Hz ac supply. If the firing angle is 30° , determine i) average output voltage, ii) output current iii) input power factor.	6	CO3	3
	b) Explain the effect of source inductance in full wave rectifier with R load	4	CO3	2
<u>UNIT-IV</u>				
7.	Draw the circuit diagram of a six-pulse or three phase converter with R load. Discuss its working principle. Draw the voltage and current waveforms. Determine the following parameters: i) dc output voltage, ii) average dc load current, iii) rms output voltage, iv) rms load current.	10	CO4	2
(OR)				
8.	Draw the circuit diagram of a 3-phase dual converter and explain its operation with neat waveforms.	10	CO4	2

UNIT-V

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|----|----|--|---|-----|---|
| 9. | a) | Describe the V-I characteristics of TRIAC and modes of operation. | 4 | CO5 | 2 |
| | b) | A single-phase half-wave AC voltage controller is connected with a load of $R = 5 \Omega$ with an input voltage of 230 V, 50 Hz. If the firing angle of the thyristor is 45° , determine i) RMS output voltage, ii) Power delivered to load | 6 | CO5 | 3 |

(OR)

- | | | | | | |
|-----|--|--|----|-----|---|
| 10. | | Describe the working of the 1-Phase cyclo converter with RL load and draw the relevant waveforms | 10 | CO5 | 2 |
|-----|--|--|----|-----|---|

UNIT-VI

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|-----|----|---|---|-----|---|
| 11. | a) | Explain the operation of a boost converter with a neat circuit diagram and waveforms. | 4 | CO6 | 2 |
| | b) | Explain the operation of a single-phase full bridge inverter with an R load | 6 | CO6 | 2 |

(OR)

- | | | | | | |
|-----|----|--|---|-----|---|
| 12. | a) | Derive the load voltage and current expressions of a step-down chopper | 6 | CO6 | 2 |
| | b) | Explain the types of modulation strategies used in an inverter with neat diagrams. | 4 | CO6 | 2 |

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

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	<u>UNIT-I</u>	Marks	CO	Blooms Level
1.	a) What are the phases in Software development life cycle	5	1	Understand
	b) Discuss about the problems in OOSE	5	1	Understand
	(OR)			
2.	a) Compare Evolutionary Model and Iterative Mode	5	1	Understand
	b) Explain Agile development methods	5	1	Understand
	<u>UNIT-II</u>			
3.	Explain functional and Non-functional requirements in software development	10	2	Understand
	(OR)			
4.	a) Define SRS. What are its characteristics?	6	2	Remember
	b) What is the use of Decision tables in software requirements process	4	2	Understand
	<u>UNIT-III</u>			
5.	a) Differentiate cohesion and coupling with examples	6	3	Understand
	b) What are the golden rules for User interface design	4	3	Understand
	(OR)			
6.	a) Draw the DFD for steps in Software development life cycle	5	3	Understand
	b) Differentiate between High-level design and detailed design	5	3	Understand
	<u>UNIT-IV</u>			
7.	a) Define software testing. What are the four levels of testings?	5	4	Understand
	b) Explain regression testing and its objective	5	4	Understand
	(OR)			
8.	Explain the process of computing cyclomatic complexity with example	10	4	Understand
	<u>UNIT-V</u>			
9.	a) Define software reliability and its measure	5	5	Understand
	b) What are the five levels of SEI-CMM? Define level 4 and level 5	5	5	Understand
	(OR)			
10.	a) Explain software reengineering with example	5	5	Understand
	b) Define software quality. What are the metrics to assess the software quality?	5	5	Understand
	<u>UNIT-VI</u>			
11.	a) Explain Service-Oriented Architecture with example	6	6	Understand
	b) List and define any two software cost estimation models	4	6	Remember
	(OR)			
12.	a) What is the objective of Software as-a service? explain	6	6	Understand
	b) List and define any two metrics for architectural design	4	6	Remember

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****III B.Tech I Semester Regular/Supplementary Examinations, October-2023****MANUFACTURING TECHNOLOGY - II
(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

	<u>UNIT-I</u>	Marks	CO	Blooms Level
1. a)	Draw Merchant's force diagram. State the assumptions made in the development of such a diagram.	5	CO1	Understanding
b)	What are the various types of chips? Under what conditions is each formed?	5	CO1	Understanding
	(OR)			
2. a)	Write short notes on crater wear and flank wear.	5	CO1	Understanding
b)	What are the factors influencing in selection of cutting speeds and feeds for machining operation?	5	CO1	Understanding
	<u>UNIT-II</u>			
3. a)	What are the differences between capstan and turret lathe?	5	CO2	Understanding
b)	Explain the various types of chucks in detail.	5	CO2	Understanding
	(OR)			
4. a)	Explain briefly the following operations with neat sketches: (i) Knurling (ii) Turning. iii) Facing	5	CO2	Understanding
b)	Explain the tool post with neat sketch.	5	CO2	Understanding
	<u>UNIT-III</u>			
5.	Sketch and describe any one quick return mechanism of shaper	10	CO3	Understanding
	(OR)			
6. a)	Draw a neat sketch of slotter and name its main parts	5	CO3	Understanding
b)	Explain about the shaper machine with neat sketch?	5	CO3	Understanding
	<u>UNIT-IV</u>			
7.	Draw the block diagram of a horizontal milling machine and explain briefly its various parts.	10	CO4	Understanding
	(OR)			
8.	Describe the different types of cutters used in milling operations and give an application of each type.	10	CO4	Understanding
	<u>UNIT-V</u>			
9. a)	Discuss various types of abrasive materials used in grinding wheel.	5	CO5	Understanding
b)	Describe the working principle of grinding operation and mention its applications.	5	CO5	Understanding
	(OR)			
10. a)	Differentiate between lapping and honing.	5	CO5	Understanding
b)	Discuss the operation of abrasive jet machining.	5	CO5	Understanding
	<u>UNIT-VI</u>			
11.	Explain the terms: Hole based system, shaft based system. Enumerate the differences between them.	10	CO6	Understanding
	(OR)			
12.	Explain the different types of fits used in engineering practice with neat sketches.	10	CO6	Understanding

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) Write types of admixtures and explain them with their purpose in concrete. 7 M
b) What are accelerators and admixtures? Explain its use with examples. 7 M

(OR)

2. a) Explain the basic chemistry of cement and manufacture of ordinary Portland cement. 7 M
b) Explain the various tests conducted on aggregates used for concreting. 7 M

UNIT-II

3. a) Explain different methods conducted to determine the workability of concrete. 7 M
b) What is workability? What are the factors affecting workability? 7 M

(OR)

4. a) Explain how concreting is done in hot weather and cold weather conditions? 7 M
b) Explain the various means of transporting concrete to work site. 7 M

UNIT-III

5. a) Explain the tensile and compressive strength considerations of concrete. 7 M
b) With a neat sketch explain the Schmidt's Rebound hammer test. What are the limitations of this test? 7 M

(OR)

6. a) What is curing? What are the different methods of curing? Also explain the term 'maturity rule'. 7 M
b) Write short notes on 7 M
(i) Elasticity of concrete (ii) Shrinkage (iii) Creep (iv) Durability of concrete

UNIT-IV

7. a) Explain what is mix design and its practical necessity. 7 M
b) Write the design steps of a mix design by IS code method. 7 M

(OR)

8. Design a concrete mix of M30 grade. Take standard deviation of 5 MPa. The specific gravities of coarse aggregate and fine aggregate are 2.75 and 2.62 respectively. The bulk density of coarse aggregate is 1610 kg/m^3 and fineness modulus of aggregate is 2.70. A slump of 60 mm is necessary. The water absorption of coarse aggregate is 1% and free moisture in fine aggregate is 2%. Design the concrete mix using IS code method. Assume any missing data. 14 M

UNIT-V

9. a) What is the need to study fiber reinforced concrete and explain briefly the factors effecting properties of fiber reinforced concrete? 7 M
b) What is polymer concrete? What are the different types of polymers? 7 M

(OR)

10. a) Write about 7 M
(a) Light weight aggregate concrete (b) Self compacting concrete
(c) No-fines concrete
b) Explain salient features of cellular concretes. 7 M

AR16

CODE: 16CS3012

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech I Semester Supplementary Examinations, October,2023

**Computer Networks
(COMMON TO CSE & IT)**

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) Explain the process of exchanging data Using OSI model with proper schematic diagram? 7
 - b) Define the usage of following addresses: 7
 - (i) Physical Address (ii) Logical Address (iii) Port Address. 7
 - Explain which layers meant to allow these addresses in TCP/IP model.
- (OR)**
2. a) Explain several physical structures and their characteristics defined in any computer network? 7
 - b) Explain the detailed Layered architecture model for peer to peer OSI based data model? 7

UNIT-II

3. a) Explain various flow control mechanisms and their processes in detail with neat sketch? 7
 - b) Differentiate ALOHA protocol from CSMA protocols in terms of their operation? Which protocol can perform better results? Evaluate it? 7
- (OR)**
4. a) Explain the HDLC protocol and Elaborate what are parameters were used to characterize it? 7
 - b) Explain various techniques for detecting errors during passage of data in computer networks? Elaborate it? 7

UNIT-III

5. a) Explain the clear processes of Virtual-Circuit and Datagram Subnets concepts in detail? Which process is better than other? Give justification? 7
- b) Discuss about Distance Vector Routing and Flooding techniques with operation? Decide which routing algorithm shows better performance? Explain it? 7
- (OR)**
6. a) Discuss General Principles of Congestion Control and its Prevention Policies? 7
- b) Why IP is needed in Network model? Explain the all fields of IPv4 packet header format with neat sketch? 7

UNIT-IV

7. a) List out the various functions defined and developed in Transport layer? Explain each functions in detail? 7
- b) Explain that how will you show that the UDP protocol contains connectionless services then prove it with the help of datagram header? 7
- (OR)**
8. a) Why TCP is most familiarly used protocol in Transport layer? Explain TCP services and features in detail? 7
- b) Explain TCP connection Establishment process in detail with neat sketch? 7

UNIT-V

9. a) Write short notes on DNS mechanism and SNMP mechanism? 7
- b) Explain E-mail architecture with detailed procedure for handling message travelling from X Gmail user to Y Gmail user? 7
- (OR)**
10. a) Distinguish between Static Web Document and Dynamic Web Document in terms of their features, merits, demerits? 7
- b) Describe the Hyper Text Transfer protocol mechanism? 7

AR16

CODE: 16ME3015

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech I Semester Supplementary Examinations, October, 2023

**METAL CUTTING AND MACHINE TOOLS
(MECHANICAL 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) Explain cutting tool geometry of single point cutting tool with neat diagram? 6M
- b) What are the circumstances under which a negative rake angle tool is used? 8M
- (OR)**
2. a) Compare and contrast orthogonal cutting and oblique cutting with a neat sketch 8M
- b) If the tool life has to be doubled what should be the ratio of cutting speeds if $n=0.33$. 6M

UNIT-II

3. a) Explain with neat sketches about various Lathe operations. 8M
- b) How much machining time will be required to reduce the diameter of a cast iron rod from 120 mm to 116mm over a length of 100 mm by turning using a carbide insert. Choose cutting speed $V = 100$ m/min depth of cut $d = 1$ mm and feed $f = 0.2$ mm/rev 6M
- (OR)**
4. a) Suggest and explain a taper turning method for very steep and accurate taper turning on a long work piece with free hand sketch diagram. 7M
- b) Explain briefly about different types of lathe attachments. 7M

UNIT-III

5. a) How to adjust stroke length and position of stroke in a shaper machine? Describe with neat sketches. 7M
b) Sketch and explain the slotting machine working principle and its parts. 7M

(OR)

6. a) Describe twist drill nomenclature using sketches 7M
Given that hole diameter 20 mm; depth to be drilled 70 mm; feed 1.2 mm/rev; cutting speed 60 m/min, find out drill rpm, and cutting time and metal removal rate assuming tool approach and over run travel as 5 mm.
b) Briefly explain the following operations with help of neat sketches: 7M
(i) reaming (ii) tapping (iii) Counter boring.

UNIT-IV

7. a) Explain centerless grinding process with a neat sketch. 6M
b) How do you select a grinding wheel? Explain grinding wheel specifications briefly. 8M

(OR)

8. Explain briefly following processes with neat sketch: 14M
(i) Honing (ii) Lapping (iii) Super finishing (iv) Polishing (v) Buffing (vi) Gear hobbing (vii) Abrasive jet machining

UNIT-V

9. a) Explain the different types of fits used in engineering practice with neat sketches 6M
b) a) Differentiate the following
i) Hole basis system and shaft basis system 8M
ii) Selective assembly and interchangeable assembly

(OR)

10. a) State and explain the “Taylor’s principle of gauge design”. Explain the following in connection with gauge design: (i) Gauge maker’s tolerance (ii) Wear allowance 7M
b) Design a GO and NOGO inspection gauges to check a hole and shaft of assembly 22H7/f8. Allow unilateral gauge tolerance of 10% with a wear allowance equal to one fifth of the gauge tolerance. 7M
Given that $i = 0.45 (D)^{1/3} + 0.001D$, fundamental deviation of ‘f’ = $-5.5 D^{0.41}$, 22 mm falls in the diameter step of 18 mm and 25 mm, IT7=16i, IT8=25i.

AR18

CODE: 18CST309

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech I Semester Supplementary Examinations, October, 2023

**Computer 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 components needed for Data Communication. 4M
b) Discuss the functions of physical, data link, transport and network layers in OSI Reference Model 8M

(OR)

2. a) Explain the categories of networks. 6M
b) Describe the logical and physical addresses with an example. 6M

UNIT-II

3. a) Demonstrate the CRC with a numerical example. 8M
b) Which protocol is better when compared the pure ALOHA with slotted ALOHA? 4M

(OR)

4. a) Explain the CSMA protocol principle and its variations. 8M
b) Summarize the protocol Selective Repeat. 4M

UNIT-III

5. a) Illustrate the network layer design issues. 6M
b) List out the similarities or differences between IPv4 and IPv6. 6M

(OR)

6. a) Explain the Link state routing algorithm with an example. 8M
b) What is congestion and explain briefly. 4M

UNIT-IV

7. a) What are the key elements in client/server paradigm? 7M
b) Explain about the User Datagram. 5M

(OR)

8. a) How does the function process to process delivery by transport layer. 6M
b) List and explain TCP services. 6M

UNIT-V

9. a) Why SNMP is important in network management. 6M
b) Define www and explain briefly about www architecture. 6M

(OR)

10. a) Outline the architecture of email system. 8M
b) Why the HTTP protocol important in WWW? 4M

**ANTENNAS AND WAVE PROPAGATION
(ELECTRONICS AND COMMUNICATION 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) Define radiation resistance and show that the radiation resistance of dipole antenna is 73 Ohms. 6 M
 - b) List any of the three antenna parameters and explain their significance. 6 M
- (OR)**
2. a) Compare monopole antennas and dipole antennas. 6 M
 - b) Estimate the directivity of a half-wave dipole antenna. 6 M

UNIT-II

3. a) Consider a two-point sources element array separated by a distance “d”. Determine the total far field E for the given array. 6 M
 - b) An end-fire array composed of $\lambda/2$ radiators with axes at right angles to the line of the array is required to have a power gain of 20. Determine the array length and the width of a major lobe between the nulls. 6 M
- (OR)**
4. a) Derive the expression for the total far field for an array of two-point sources at a point P in the direction of Θ . 6 M
 - b) A uniform linear array consists of 16 isotropic sources with a spacing of $\lambda/4$. If the phase difference (ϕ) is -90° . Determine HPBW, directivity and effective aperture. 6 M

UNIT-III

5. a) With a neat diagram explain the helical antenna and briefly describe its operation in axial mode. 6 M
 - b) Explain the folded dipole antenna and its characteristics 6 M
- (OR)**
6. a) Illustrate the working principle of the Helical antenna in normal mode with a neat diagram 6 M
 - b) Write the features of traveling wave antennas. 6 M

UNIT-IV

7. a) Narrate in detail about the Cassegrain feed of a parabolic reflector. 6 M
 - b) Describe the working principle, design, and applications of a microstrip patch antenna. 6 M
- (OR)**
8. a) Describe the antenna gain measurement method. 6 M
 - b) Explain the basic principle of lens antenna and write the applications of lens antenna. 6 M

UNIT-V

9. a) Write the salient features of ground wave propagation. 6 M
 - b) Derive the expression for fundamental equation for free space wave propagation. 6 M
- (OR)**
10. a) What is meant by space wave propagation? Explain. 6 M
 - b) Write a short note on critical frequency and skip distance. 6 M

**POWER ELECTRONICS
(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) Draw the V-I characteristics of SCR and explain it briefly? 6M
b) Describe the switching characteristics of power MOSFET and IGBT and compare them? 6M

(OR)

2. a) Discuss about the different turn ON methods of a SCR. 6M
b) Describe the switching characteristics of power MOSFET 6M

UNIT-II

3. a) Explain the performance of a single-phase full converter with the help of voltage waveforms for R-load. Derive an expression for its Average output voltage and current in terms of supply voltage. 6M
b) A single phase full converter is supplied from 230 V, 50 Hz source. The load consists of $R = 10 \Omega$. Calculate i) Average output voltage ii) Average output current For a firing angle of 45° 6M

(OR)

4. a) Explain the working of single- phase half- wave converter with relevant wave forms for R-L Load. 6M
b) A single phase 220 V, 1 kW heater is connected to a half- wave controlled rectifier and fed from a 220 V, 50 Hz ac supply. Calculate the power absorbed by the heater when i) $\alpha = 30^\circ$ 6M

UNIT-III

5. a) Describe the operation of three phase dual converter with circulating current mode. And also derive the condition for circulating current mode. 8M
b) What are advantages and disadvantages of three phase dual converter 4M

(OR)

6. a) Draw the circuit diagram of three – phase, half –wave controlled rectifier with R load and explain its operating principle with voltage and current waveforms. Determine the following parameters for R load with firing angle $\alpha = 45^\circ$: i) DC output voltage ii) Average DC load current iii) RMS output voltage iv) RMS load current. 12M

UNIT-IV

7. a) Draw the single – phase bidirectional AC voltage controller with R load and explain its working principle with waveforms. 6M
b) Draw the waveforms for 1-phase AC voltage regulator for R load for firing angle 60° 6M

(OR)

8. Describe principle of working of 1 – phase to 1 - phase step down midpoint type cyclo-converter for both continuous and discontinuous conductions. Draw voltage and current waveforms for both conditions 12M

UNIT-V

9. a) Explain the operating principle of DC chopper with a suitable diagram. Draw the voltage and current waveforms of chopper. Derive expressions for average output voltage and RMS output voltage. 6M
b) Discuss the principle of operation of Buck-Boost converter. 6M

(OR)

10. a) Explain the different control strategies in DC-DC converters? 6M
b) With a neat circuit diagram, explain the principle of operation of a boost converter 6M

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 main types of machine tools used in metal cutting processes and explain their respective applications. 6M
- b) Discuss the process of chip formation in metal cutting. Explain Orthogonal cutting process. 6M

(OR)

2. a) Illustrate and explain Merchant's Force diagram with neat sketch. How does it help in analyzing cutting forces? 6M
- b) Discuss the concept of tool life and its significance in metal cutting operations. What are the factors that affect tool life? 6M

UNIT-II

3. a) Explain the constructional features of a lathe and their functions in the machining process. 6M
- b) Describe various operations that can be performed on a centre lathe. 6M

(OR)

4. a) Differentiate between capstan and turret lathes. 6M
- b) Discuss an overview of Swiss type automatic lathes. 6M

UNIT-III

5. a) Compare and contrast the working principles of shaper, planer, and slotter machines. 6M
- b) Explain the constructional features of a shaper machine. How does the arrangement of components enable its reciprocating motion? 6M

(OR)

6. a) Describe the various operations that can be performed on a milling machine. 6M
- b) Explain the principles of drilling operation. What are the different operations performed on drilling machines. 6M

UNIT-IV

7. a) What factors should be considered when selecting a grinding wheel for a specific application? 6M
- b) What is centerless grinding, and how does it work? 6M

(OR)

8. a) Differentiate between lapping and honing processes. 6M
- b) What is gear hobbing, and how does it work? 6M

UNIT-V

9. a) Differentiate between deviations and allowances in the context of fits and tolerances. 6M
- b) What is the difference between unilateral and bilateral tolerance systems, and when might each be preferred in manufacturing? 6M

(OR)

10. a) Explain Taylor's principle in the context of limit gauges. 6M
- b) Differentiate between plug gauges and ring gauges. 6M