# AR20

**CODE: 20HST101** **SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**I B.Tech I Semester Regular/Supplementary Examinations, April-2022**

**ENGLISH**

**(Common to CE, CSE, AI & ML, IT, MECH Branches)**

**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 the significance of the title of the story "Father's Help"? 5m

   b) Provide at least two antonyms for each of the following words. 5x1=5m
   i. Praise ii. Confident iii. Humble iv. Lazy
   v. Abundant

**(OR)**

2. a) What might have prompted father to tear the letter? 5m

   b) Write 'one-word substitutes' for the following expressions: 5x1=5m
   i. The study of ancient societies
   ii. State in which the few govern the many
   iii. A person pretending to be somebody he is not
   iv. A person who knows many foreign languages
   v. One who possesses many talents

## UNIT-II

3. a) What does Abdul say about his days during the World War? 5m

   b) Fill in the blanks with the correct form of the given verb. 5x1=5m

   i. If you ---- (have) any questions about the general management of the department, Bob is the best person whom you can consult.
   ii. If it is raining and they can't go outside, watching cartoons ---- (appeal) to most children.
   iii. Unless more people begin to use public transportation, the quality of our air ---- (become) worse in near future.
   iv. Had I not lost your address and telephone number, I ---- (notify) you of my visiting Washington and stayed at your house.
   v. If you ---- (want) to reduce your risk of suffering from coronary heart disease, obesity or mental health problems, specialists indicate you should be physically active.

**(OR)**

4. a) What do you learn about APJ Abdul Kalam's family from the lesson "My Early Days"? 5m

b) Rewrite the sentences in passive voice. 5x1=5m

i. The sheep ate a lot. ii. We do not clean our rooms.

iii. William will not repair the car.

iv. Did Sue draw this circle? v. Could you feed the dog?

## UNIT-III

5. a) What is the moral presented by the poet in the poem 'The Road not Taken'? 5m

b) Write the following as directed. 5x1=5m

i. Ritu said that she was watching a movie. (into direct speech)

ii. Raju said to Raghu, "You can take whatever you want." (into indirect speech)

iii. "I met Ashok yesterday," he said. (into indirect speech)

iv. Sastry said, "I have a car." (into indirect speech)

v. "Don't you know the way home?" she said to me. (into indirect speech)

**(OR)**

6. a) Describe the two roads the author finds. 5m

b) Combine each of the following simple sentences into Complex sentences. 5x1=5m

i. It is my opinion. The room needs to be painted.

ii. The weather will improve. We shall go for a picnic.

iii. Your progress is quite satisfactory. I am happy.

iv. He went to various places. He was welcomed everywhere.

v. I could not get my seat reserved. I managed a comfortable journey.

## UNIT-IV

7. a) What is the central idea in George Orwell's "Politics and the English Language"? How does he convey this idea? 5m

b) Punctuate the following sentences meaningfully. 5x1=5m

i. Ruth was invited to the party but she was ill so Jane went instead of her

ii. Sorry to disturb you could I speak to you for a moment

iii. Is it any use expecting them to be on time

iv. Johns going to sleep during the wedding was rather embarrassing.

v. Having lost all my money I went home

**(OR)**

8. a) From "Politics and the English Language," what is Orwell's best example that shows why political writing is bad writing? Give a quote, say why, and analyze. 5m

b) Complete the sentences with one of the prepositions from the following list. 5x1=5m

(After, at, between, by, for, from, in, of, on, since, to, with)

i. He left a few days ago and we haven't heard from him _____ then.
ii. Turn right _____ the first traffic lights, then turn left.
iii. William of Normandy conquered Britain _____ 1066.
iv. They live _____ the end of the street.
v. Judy has lost weight because she always goes to fitness classes _____ work.

## UNIT-V

9. a) Write a note on the theme of the play "Mothers Day". Do you approve of the method adopted by Mrs. Fitzgerald? Elucidate. 5m

b) Write a letter to the 'Union Environment Minister' expressing your anxiety and requesting to take steps to stop mass killing of wild animals. 5m

**(OR)**

10. a) Compare and contrast the characters of Mrs. Fitzgerald and Mr. Pearson. Who do you admire and why? 5m

b) As a President of Spring Field Residents Club, write an email to the member inviting them to participate in the cleanliness drive to be launched at the central park and surrounding on Sunday at 9:00 am. Send the email to multiple recipients. 5m

## UNIT-VI

11. a) What was Chipko movement and what value does Chipko movement invoke? 5m

b) Read the passage given below and answer the questions that follow: 5x1=5m

One of the great values of punctuality is that it gives discipline to life. We have to get up in time. We have to do things at the appointed time. All these entails certain amount of sacrifice. It dispels laziness and removes our 'take-it-easy attitude'. A disciplined person always gets recognition and social acceptance. He is wanted and appreciated. Therefore, punctuality can make us socially acceptable people. Another significant merit of punctuality is that it provides ample time to do our work correctly and properly. Doing things hurriedly or haphazardly can have disastrous consequences. When we do things in time there is every

chance that they end up as fine works. The virtue of punctuality is said to be the key to success. Look at the great world leaders who have achieved fame and success. Punctuality was their hallmark. They kept their promises. Punctuality is a virtue that is appreciated by all. Washington once took his secretary to task for being late. The secretary laid the blame upon his watch. Washington reported: "Then, Sir either you must get a new watch or I must get a new secretary." People like them are ideals whom we should follow in earnest. When individuals are not punctual, they cause a lot of inconvenience to others. People have to wait for them and waste their valuable time. Want of punctuality reveals want of culture and is discourteous to the person we fail. Unpunctuality invites trouble and worry. History is full of cases which show that lack of punctuality has caused defeat, loss of kingdom and golden opportunities. It is said that Napoleon lost the battle of Waterloo in 1815 because one of his generals came late. Many people lose good. opportunities of job or promotion when they reach late for appointment. All of us are not born with the virtue of punctuality. We have to cultivate it painstakingly. Only constant vigil and practice can implant this virtue. It calls for great deal of sacrifice. It calls for courage to root out laziness and the 'take-it easy attitude'. It demands a disciplined life. That is why very few individuals have the virtue of punctuality. But, know it for certain that it is the surest way to success.

**i.** What is the writer's concern in this passage?
**ii.** What would be the consequences of not maintaining punctuality in your work?
**iii.** Give some examples to show that lack of punctuality has caused trouble and worry.
**iv.** How did the great world leaders achieve fame and success in their life?
**v.** Give one word for 'to keep a strict watch'.

**(OR)**

12. a) What do you understand by environmental movements? What positive changes do they bring in the social realm? 5m

b) Write an essay on "Indian cinema : an escape from reality" 5m



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# AR20

**CODE: 20EET101** **SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**I B.Tech I Semester Regular/Supplementary Examinations, April-2022**

**ELECTRONIC DEVICES AND CIRCUITS**

**(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) | With neat sketches explain the V-I characteristics of PN junction diode. | 6M |
| | b) | Explain how diode can acts as a switch? | 4M |
| | | **(OR)** | |
| 2. | a) | Explain breakdown mechanism in PN junction diodes. | 6M |
| | b) | Explain the basic principle behind the LED. Why LED operates only in forward bias? | 4M |

**UNIT-II**

| | | | |
|---|---|---|---|
| 3. | | Explain the working of Half-Wave Rectifier with input and output wave forms and Derive the following parameters of Half-Wave Rectifier:<br>a) Ripple factor b) Rectification efficiency | 10M |
| | | **(OR)** | |
| 4. | a) | Explain the working of full wave rectifier with necessary diagrams. | 5M |
| | b) | Define the following terms<br>a) Ripple factor b) Output frequency c) Rectification efficiency<br>d) TUF e) Peak Inverse Voltage (PIV) | 5M |

**UNIT-III**

| | | | |
|---|---|---|---|
| 5. | a) | Explain the construction and operation of BJT. | 5M |
| | b) | Explain the input and output characteristics of common emitter transistor configuration. | 5M |
| | | **(OR)** | |
| 6. | a) | Explain the input and output characteristics of common base transistor configuration. | 5M |
| | b) | Explain the construction and operation of FET with neat diagam. | 5M |

**UNIT-IV**

| | | | |
|---|---|---|---|
| 7. | a) | Define operating point. What is the significance of operating point on the device performance? | 5M |
| | b) | What is Thermal runaway problem in BJT? | 5M |
| | | **(OR)** | |
| 8. | a) | Derive the condition for Thermal stability in BJT. | 7M |
| | b) | Define stability factors (S, S', S'') of BJT. | 3M |

**UNIT-V**

| | | | |
|---|---|---|---|
| 9. | a) | Explain how the BJT acts as a switch. | 4M |
| | b) | Explain the general characteristics of negative feedback amplifiers. | 6M |
| | | **(OR)** | |
| 10. | a) | Explain how BJT can acts as an amplifier. | 5M |
| | b) | Compare and contrast different types of feedback amplifiers topologies. | 5M |

**UNIT-VI**

| | | | |
|---|---|---|---|
| 11. | a) | State and explain Barkhausan's criterion for oscillations. | 4M |
| | b) | Explain the condition for starting oscillations of Collpits oscillator. | 6M |
| | | **(OR)** | |
| 12. | | Explain the operation of RC Phase shift oscillator and derive the expression for frequency of oscillations. | 10M |

# AR20

**CODE: 20ECT101** **SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**I B.Tech I Semester Regular/Supplementary Examinations, April, 2022**

**ELECTRONICS-I**

**(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) | Discuss the V-I characteristics of tunnel diode with neat diagram. | 5M |
| | b) | Differentiate between N type and P type semiconductor materials. | 5M |
| | | **(OR)** | |
| 2. | a) | Explain how the zener diode behaves as a regulator with neat diagram. | 5M |
| | b) | Describe the construction and working of LED with the help of relevant diagrams. | 5M |

## UNIT-II

| | | | |
|---|---|---|---|
| 3. | a) | Explain the working of half wave rectifier with the help of waveforms. | 5M |
| | b) | Originate the expression for ripple factor of full wave rectifier with capacitor filter. | 5M |
| | | **(OR)** | |
| 4. | a) | Compare Half wave, Full wave and Bridge rectifier circuits. | 5M |
| | b) | Originate the expression for ripple factor of full wave rectifier with L- filter. | 5M |

## UNIT-III

| | | | |
|---|---|---|---|
| 5. | a) | Justify the following statements<br>i. Why collector region is greater than emitter region?<br>ii. Why depletion layer width at the collector junction is more than the depletion layer width at emitter junction? | 5M |
| | b) | For a certain transistor $I_C$= 5.225mA, $I_B$= 100μA and $I_{CBO}$= 5μA. Calculate (i) α, β and $I_E$. (ii) Determine the new level of $I_B$ required to make $I_C$=15mA. | 5M |
| | | **(OR)** | |
| 6. | a) | Define α, β and γ of a transistor and derive the relation between them. | 5M |
| | b) | Calculate the collector current and emitter current for a transistor with $\alpha_{dc}$ = 0.99 and $I_{CBO}$= 50μA when the base current is 20μA. | 5M |

## UNIT-IV

| | | | |
|---|---|---|---|
| 7. | a) | Explain the collector to base bias method with neat diagram. | 5M |
| | b) | Consider the self bias circuit where $V_{CC}$= 12V, $R_C$ =2.5K ohms, $R_E$ =500 ohms, $R_1$ =60K ohms, $R_2$ =8K ohms, $h_{fe}$= 50, $V_{BE}$ =0.6V. The transistor operates in active region. Determine the operating point and its stability factor. Assume necessary data if required. | 5M |
| | | **(OR)** | |
| 8. | a) | Explain the self bias method with neat diagram. | 5M |
| | b) | Design fixed bias circuit for the following specifications: $I_{CQ}$ =9.2mA, $V_{CEQ}$ =4.4V, $h_{fe}$ =100, $V_{BE}$ =0.7V and $V_{CC}$ =9V. Assume necessary data if required. | 5M |

## UNIT-V

9. a) Analyze the CE Amplifier circuit using exact analysis and obtain the expressions for Voltage gain ($A_V$), Current gain ($A_I$), 5M

   b) Design an emitter follower having $R_i$=500k Ω, $R_o$=20 Ω, Assume $h_{fe}$=50, $h_{ie}$=1KΩ, $h_{oe}$=25μA/V. Calculate $A_I$, $A_V$ for the emitter follower. Assume necessary data if required. 5M

**(OR)**

10. a) Analyze the CC Amplifier circuit using exact analysis and obtain the expressions for Voltage gain ($A_V$), Current gain ($A_I$). 5M

    b) Consider a single stage CE amplifier with Rs = 1KΩ, $R_e$ = 50 KΩ, $R_2$ = 2KΩ, $R_c$ = 1KΩ, $R_L$ = 1.2KΩ, $h_{fe}$ = 50, $h_{oe}$ = $h_{re}$ = 0, $h_{ie}$ = 1.1K. Find $A_I$, $R_o$, $A_v$ and $R_i$. Assume necessary data if required. 5M

## UNIT-VI

11. a) Show that for current series feedback amplifier input and output resistances are increased by a factor of (1+Aβ) with feedback. 5M

    b) Define the following amplifier circuits and draw its equivalent circuits. 5M

       (i) Voltage amplifier (ii) Current amplifier

       (iii) Transconductance amplifier

       (iv) Transresistance amplifier

**(OR)**

12. a) Show that for voltage shunt feedback amplifier input and output resistances are decreased by a factor of (1+Aβ) with feedback. 7M

    b) Write the advantages and disadvantages of negative feedback. 3M



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# AR18

**CODE: 18EET101** **SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**I B.Tech I Semester Supplementary Examinations, April-2022**

## SWITCHING THEORY AND LOGIC DESIGN

**(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. Convert the following to Decimal number system and then to Binary number system
   i) $(1416)_H$ ii) $(7012)_8$ iii) $(1212)_{10}$ **[3x4= 12M]**

**(OR)**

2. Represent the following numbers using 1's Complement Method and also using 2's Complement Method

   i) $(1010111)_2$ ii) $(1110100)_2$ iii) $(110011)_2$

   iv) $(101101)_2$ v) $(10011001)_2$ vi) $(11110000)_2$ **[6x2= 12M]**

### UNIT-II

3. Simplify and draw the AND/OR implementations for the following switching functions?
   i ) (A' + B) (B' + C)+ (AB + C) ii) (A + B)' (ABC)'+ (A'C)' **[6+6= 12M]**

**(OR)**

4. Minimize the criterion the following using K-map. **[12M]**
   f(A,B,C,D).= ∑m (0,1,2,3,5,6,7,8,9,10,11,13)

### UNIT-III

5. a) Design Full Adder using two half adders and one OR gate. **[6M]**

   b) Design Full Subtractor using two half subtractors and one OR gate. **[6M]**

**(OR)**

6. a) Draw and Explain the BCD adder circuit. **[6M]**

   b) Explain the operation of 4-Bit Parallel Adder. **[6M]**

### UNIT-IV

7. Design 32 to 1 Multiplexer . **[12M]**

**(OR)**

8. Design Decimal to Binary Encoder? **[12M]**

### UNIT-V

9. Describe the operation of universal shift register with the help of diagram? **[12M]**

**(OR)**

10. Design mod-9 asynchronous counter using D flip flop? **[12M]**

# AR18

**CODE: 18EST104** **SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**I B.Tech I Semester Supplementary Examinations, April-2022**

**ELEMENTS OF WORKSHOP TECHNOLOGY**

**(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. | a) | How do sheet metal work different from fitting? | 6M |
| | b) | Explain the benefits of modern manufacturing process with conventional manufacturing. | 6M |
| | | **(OR)** | |
| 2. | a) | What is Safety? Write some safety precautions in Fitting and Carpentry. | 6M |
| | b) | What are the classification of the manufacturing process? Explain any two | 6M |

## UNIT-II

| | | | |
|---|---|---|---|
| 3. | a) | What are the qualities that a good timber should possess? | 4M |
| | b) | What are the common types of wood cutting tools used in carpentry? Explain any two. | 8M |
| | | **(OR)** | |
| 4. | | Sketch and describe the following joints made in a carpentry shop<br>iii) Mortise and Tenon joint ii) Briddle Joint iii) Cross lap joint | 12M |

## UNIT-III

| | | | |
|---|---|---|---|
| 5. | a) | How are files classified? | 4M |
| | b) | Describe with neat sketch any four files used in fitting. | 8M |
| | | **(OR)** | |
| 6. | a) | Sketch twist drill and describe its parts. | 6M |
| | b) | What are advantages of twist drills over flat drills | 6M |

## UNIT-IV

| | | | |
|---|---|---|---|
| 7. | a) | What are the different types of sheet metal joints? Explain any two. | 6M |
| | b) | Which metals are commonly used in sheet metal work? Give a brief description of any two metals. | 6M |
| | | **(OR)** | |
| 8. | | Write short notes on the following sheet metal operations.<br>i) Laying out ii) Shearing iii) Nibbling iv) Piercing v) Blanking<br>vi) Edge forming and wiring | 12M |

## UNIT-V

| | | | |
|---|---|---|---|
| 9. | a) | What are the common forging defects, and explain any three defects. | 6M |
| | b) | What is forge welding? Explain with neat sketch. | 6M |
| | | **(OR)** | |
| 10. | | Explain with sketches the following operations<br>i) Upsetting ii) Drawing out iii) Bending iv) Punching | 12M |



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# AR18

**CODE: 18ECT101** **SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**I B.Tech I Semester Supplementary Examinations, April-2022**

**ELECTRONIC DEVICES**

**(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) | What is Fermi level? Derive Fermi level expression in an Extrinsic Semiconductor? | 6M |
| | b) | The Intrinsic carrier concentration of silicon sample at 300k is $1.5\times10^{16}/m^3$. If after doping the number of majority carriers is $5\times10^{20}/m^3$, Calculate minority carrier density | 6M |
| | | **(OR)** | |
| 2. | a) | Explain drift and diffusion currents for a semiconductor and derive expression for total current density? | 6M |
| | b) | Explain about classification of materials based on energy band diagrams. Also define i) doping ii) dopant iii) acceptor iv) donor with respect to semiconductor | 6M |

**UNIT-II**

| | | | |
|---|---|---|---|
| 3. | a) | A silicon P-N Junction diode under reverse bias has depletion region width of 10μm. The relative permittivity is $\varepsilon_r = 11.7$ and $\varepsilon_0 = 8.85\times10^{-12}$ F/m. Calculate depletion capacitance of diode per square metre? | 6M |
| | b) | With a neat circuit diagram, explain how Zener diode acts as a voltage regulator? | 6M |
| | | **(OR)** | |
| 4. | a) | Explain formation of depletion region in an open circuit PN junction with neat diagram? | 6M |
| | b) | Compare Zener and Avalanche breakdown mechanisms? | 6M |

**UNIT-III**

| | | | |
|---|---|---|---|
| 5. | a) | Explain current components in transistor with neat diagram? | 6M |
| | b) | Explain base width modulation and mention what happens due to early effect? | 6M |
| | | **(OR)** | |
| 6. | a) | Mention applications of transistor and explain at least one application other than transistor as an amplifier? | 6M |
| | b) | Draw circuit diagram for transistor in CE configuration and explain about its input and output characteristics? | 6M |

**UNIT-IV**

| | | | |
|---|---|---|---|
| 7. | a) | Explain the working of MOSFET in depletion mode and explain its Drain and transfer characteristics? | 7M |
| | b) | Write the advantages of FET over BJT? | 5M |
| | | **(OR)** | |
| 8. | a) | Explain the terms (i) Drain resistance (ii) Amplification factor (iii) Trans Conductance | 6M |
| | b) | Explain how JFET acts as a switch? | 6M |

**UNIT-V**

| | | | |
|---|---|---|---|
| 9. | a) | Describe the working principle of LED and write down its merits? | 6M |
| | b) | Explain the operation of Varactor diode with neat diagrams? | 6M |
| | | **(OR)** | |
| 10. | a) | Explain working and V-I characteristics of UJT? | 6M |
| | b) | Discuss in detail about operation of Photo diode? | 6M |



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