	Electronics Components and Circuits (EE 3rd Semester) **Unit 2: TRANSISTORS, VOLTAGE & POWER AMPLIFIERS**
1	What is the left hand section of a junction transistor called? a) base b) collector **c) emitter** d) depletion region
2	In an NPN transistor, the arrow is pointed towards_____ a) the collector b) the base c) depends on the configuration **d) the emitter**
3	Which of the following is true in construction of a transistor? a) the collector dissipates lesser power b) the emitter supplies minority carriers c) **the collector is made physically larger than the emitter region** d) the collector collects minority charge carriers
4	In the operation of an NPN transistor, the electrons cross which region? a) emitter region b) the region where there is high depletion c) the region where there is low depletion d) **P type base region**
5	Which of the following are true for a PNP transistor? a) the emitter current is less than the collector current b) **the collector current is less than the emitter current** c) the electrons are majority charge carriers d) the holes are the minority charge carriers
6	In the saturated region, the transistor acts like a_____ a) poor transistor b) amplifier c) open switch **d) closed switch**
7	When does the transistor act like an open switch? a**) cut off region** b) inverted region c) saturated region d) active region
8	If the emitter-base junction is forward biased and the collector-base junction is reverse biased, what will be the region of operation for a transistor? a) cut off region b) saturated region c) inverted region **d) active region**
9	The transfer of a signal in a transistor is_____ **a) low to high resistance** b) high to low resistance c) collector to base junction d) emitter to base junction

10	Why is the silicon mostly chosen when compared to germanium? a) low power consumption b) high efficiency **c) greater working temperature** d) large I_{CBO}
11	In a PNP transistor operating in active region, the main stream of current is_____ a) drift of holes b) drift of electrons **c) diffusion of holes** d) diffusion of electrons
12	The larger dot of the indium is used as_____ a) base b) emitter c) control pin **d) collector**
13	The grown junction type transistors is generally used for_____ a) PNP transistors **b) NPN transistors** c) Both transistors d) Depends on the material used
14	The negative sign in the formula of amplification factor indicates_____ **a) that I_E flows into transistor while I_C flows out it** b) that I_C flows into transistor while I_E flows out it c) that I_B flows into transistor while I_C flows out it d) that I_C flows into transistor while I_B flows out it
15	The relation between α and β is _____ a) β=α/(1-α) **b) α= β/(1+β)** c) β=α/(1+α) d) α= β/(1- β)
16	The base current amplification factor β is given by_____ **a) I_C/I_B** b) I_B/I_C c) I_E/I_B d) I_B/I_E
17	The relation between α and β is_____ a) β = α/ (1-α) **b) α = β/(1+β)** c) β = α/ (1+α) d) α = β/(1- β)
18	In I_{CEO}, wt does the subscript 'CEO' mean? a) collector to base emitter open b) emitter to base collector open **c) collector to emitter base open** d) emitter to collector base open
19	When the signal is applied, the ratio of change of collector current to the ratio of change of base current is called_____ a) dc current gain b) base current amplification factor

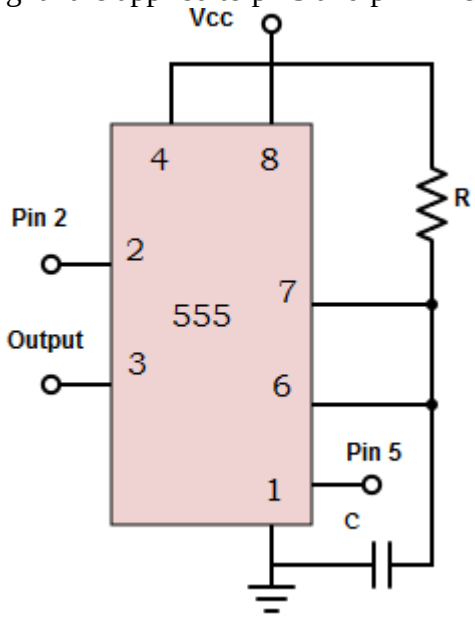
	c) emitter current amplification factor **d) ac current gain**
20	The range of β is _____ **a) 20 to 500** b) 50 to 300 c) 30 to 400 d) 10 to 20
21	The current amplification factor ϒdc is given by_____ **a) I_E/I_B** b) I_B/I_E c) I_C/I_E d) I_E/I_C
22	The relation between α and β is given by _____ a) 1/(1-α)=1- β b) 1/(1+α)=1+ β **c) 1/(1-α)=1+ β** d) 1/(1+α)=1- β
23	The application of a CC configured transistor is_____ a) voltage multiplier b) level shifter c) rectification **d) impedance matching**
24	The point on the DC load line which is represented by 'Q' is called _____ a) cut off point b) cut in point c) breakdown point **d) operating point**
25	When is the transistor said to be saturated? **a) when V_{CE} is very low** b) when V_{CE} is very high c) when V_{BE} is very low d) when V_{BE} is very high
26	The input resistance is given by _____ a) $\Delta V_{CE}/\Delta I_B$ **b) $\Delta V_{BE}/\Delta I_B$** c) $\Delta V_{BE}/\Delta I_C$ d) $\Delta V_{BE}/\Delta I_E$
27	The input resistance is given by _____ a) $\Delta V_{CE}/\Delta I_B$ **b) $\Delta V_{BE}/\Delta I_B$** c) $\Delta V_{BE}/\Delta I_C$ d) $\Delta V_{BE}/\Delta I_E$
28	The output resistance is given by _____ a) $\Delta V_{CE}/\Delta I_B$ b) $\Delta V_{BE}/\Delta I_B$ c) $\Delta V_{BE}/\Delta I_C$ **d) $\Delta V_{CE}/\Delta I_C$**
29	Which of the following cases damage the transistor? **a) when V_{CE} is increased too far** b) when V_{CE} is decreased too far

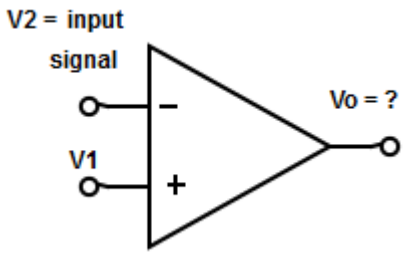
	c) when V_{BE} is increased too far d) when V_{BE} is decreased too far
30	The small amount of current which flows even when base current $I_B=0$ is called_____ a) I_{BEO} b) I_{CBO} **c) I_{CEO}** d) I_C
31	Which of the following points locates the quiescent point? **a) (I_C, V_{CB})** b) (I_E, V_{CE}) c) (I_E, V_{CB}) d) (I_C, V_{CE})
32	The input resistance in a CB transistor is given by _____ a) $\Delta V_{CE}/\Delta I_B$ b) $\Delta V_{BE}/\Delta I_B$ c) $\Delta V_{BE}/\Delta I_C$ **d) $\Delta V_{EB}/\Delta I_E$**
33	The output resistance of CB transistor is given by _____ **a) $\Delta V_{CB}/\Delta I_C$** b) $\Delta V_{BE}/\Delta I_B$ c) $\Delta V_{BE}/\Delta I_C$ d) $\Delta V_{EB}/\Delta I_E$
34	Which of the following corresponds to the output circuit of a CB transistor? a) V_{BE} b) I_B **c) V_{CB}** d) V_{CE}
35	The input of a CB transistor is given between_____ a) collector and emitter terminals b) base ad collector terminals c) ground and emitter terminals **d) emitter and base terminals**
36	The current gain of the CB transistor is_____ **a) less than or equal to unity** b) equal to unity c) greater than unity d) remains same
37	The input characteristics of a CB transistor resembles_____ a) Forward biased diode **b) Illuminated photo diode** c) LED d) Zener diode
38	In which region a transistor acts as an open switch? **a) cut off region** b) inverted region c) active region d) saturated region
39	In which region a transistor acts as a closed switch? a) cut off region

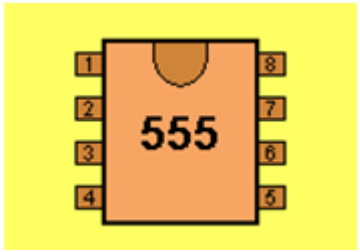
	b) inverted region c) active region **d) saturated region**
40	The current which is helpful for LED to turn on is_____ a) emitter current b) base current c) **collector current** d) depends on bias
41	Which of the following statements is true? a) Solid state switches are applications for an AC output b) **LED's can be driven by transistor logics** c) Only NPN transistor can be used as a switch d) Transistor operates as a switch only in active region
42	The base emitter voltage in a cut off region is_____ a) greater than 0.7V b) equal to 0.7V c) **less than 0.7V** d) cannot be predicted
43	In saturation region, the depletion layer_____ a) increases linearly with carrier concentration b) decreases linearly with carrier concentration c) increases by increasing the emitter current **d) decreases by decreasing the emitter voltage drop**
44	The base emitter voltage in a saturation region is_____ a) greater than 0.7V b) equal to 0.7V c) less than 0.7V **d) cannot be predicted**
45	The switching of power with a PNP transistor is called_____ a) **sourcing current** b) sinking current c) forward sourcing d) reverse sinking
46	The switching of power with a NPN transistor is called_____ a) sourcing current b) **sinking current** c) forward sourcing d) reverse sinking
47	Where should be the bias point set in order to make transistor work as an amplifier? a) Cut off **b) Active** c) Saturation d) Cut off and Saturation
48	Q point can be set to work on active region requires particular conditions. What are they? a) BE reverse biased and BC forward biased b) BE reverse biased and BC reverse biased **c) BE forward biased and BC reverse biased** d) BE forward biased and BC forward biased

49	The Q-point of a transistor is made to shift between Active and cut off Region, then how does the transistor behave? **a) Switch** b) Amplifier c) Inverter d) Bulb
50	What is Stability factor? a) **Ratio of change in collector current to change in a current amplification factor** b) Ratio of change in collector current to change in base current c) Current amplification factor d) Ratio of base current to collector current
	Unit 5: SIMPLE CIRCUIT USING IC
1	A Differential Amplifier amplifies a) Input signal with higher voltage b) Input voltage with smaller voltage c) Sum of the input voltage **d) None of the Mentioned**
2	A differential amplifier is capable of amplifying a) DC input signal only b) AC input signal only **c) AC & DC input signal** d) None of the Mentioned
3	In ideal Differential Amplifier, if same signal is given to both inputs, then output will be a) Same as input b) Double the input c) Not equal to zero **d) Zero**
4	Which is not the internal circuit of operational amplifier? a) Differential amplifier b) Level translator c) Output driver **d) Clamper**
5	The purpose of level shifter in Op-amp internal circuit is to **a) Adjust DC voltage** b) Increase impedance c) Provide high gain d) Decrease input resistance
6	What is the purpose of differential amplifier stage in internal circuit of Op-amp? a) Low gain to differential mode signal b) Cancel difference mode signal c) Low gain to common mode signal **d) Cancel common mode signal**
7	Which of the following is not preferred for input stage of Op-amp? a) Dual Input Balanced Output b) Differential Input Single ended Output

	c) Cascaded DC amplifier d) Single Input Differential Output
8	To increase the value of CMRR, which circuit is used to replace the emitter resistance Re in differential amplifier? a) **Constant current bias** b) Resistor in parallel with Re c) Resistor in series with Re d) Diode in parallel with Re
9	How to improve CMRR value a) Increase common mode gain **b) Decrease common mode gain** c) Increase Differential mode gain d) Decrease differential mode gain
10	Constant current source in differential amplifier is also called as **a) Current Mirror** b) Current Source c) Current Repeaters d) All of the mentioned
11	In practical application of current mirror, early voltage is assumed to be **a) Infinite** b) Zero c) Unity d) None of the mentioned
12	What is the general information specified in ordering an IC? a) Temperature range b) Device type c) Package type **d) All of the mentioned**
13	How an eight pin Dual-In-Line Package is shortly named a) 8p DIP b) Maxi DIP **c) Mini DIP** d) ES DIP
14	Why Integrated Circuits are considered to be economical? a) Simple manufacturing process b) Provide trouble free service c**) Due to batch production** d) Easy to use and reuse
15	Determine the time period of a monostable 555 multivibrator. a) T = 0.33RC b) **T = 1.1RC** c) T = 3RC d) T = RC
16	How to overcome mistriggering on the positive pulse edges in the monostable circuit? a) Connect a RC network at the input b) Connect an integrator at the input **c) Connect a differentiator at the input** d) Connect a diode at the input

17	Which among the following can be used to detect the missing heart beat? **a) Monostable multivibrator** b) Astable multivibrator c) Schmitt trigger d) None of the mentioned
18	A 555 timer in monostable application mode can be used for a) Pulse position modulation b) Frequency shift keying c) **Speed control and measurement** d) Digital phase detector
19	How can a monostable multivibrator be modified into a linear ramp generator? a) Connect a constant current source to trigger input b) Connect a constant current source to trigger output c**) Replace resistor by constant current source** d) Replace capacitor by constant current source
20	What will be the output, if a modulating input signal and continuous triggering signal are applied to pin5 and pin22 respectively in the following circuit?  a) Frequency modulated wave form b) **Pulse width modulated wave form** c) Both pulse and frequency modulated wave form d) None of the mentioned
21	Free running frequency of Astable multivibrator? a) **$f=1.45/(R_A+2R_B)C$** b) $f=1.45(R_A+2R_B)C$ c) $f=1.45C/(R_A+2R_B)$ d) $f=1.45\ R_A/(\ R_A+R_B)$
22	How to obtain symmetrical waveform in Astable multivibrator? a) Use clocked RS flip-flop b) **Use clocked JK flip-flop** c) Use clocked D-flip-flop d) Use clocked T-flip-flop
23	How does a monostable multivibrator used as frequency divider? a) **Using square wave generator**

	b) Using triangular wave generator c) Using sawtooth wave generator d) Using sine wave generator
24	Which circuit is used for obtaining desired output waveform in operational amplifier? **a) Clipper** b) Clamper c) Peak amplifier d) Sample and hold
25	The clipping level in op-amp is determined by a) AC supply voltage b) Control voltage **c) Reference voltage** d) Input voltage
26	In a positive clipper, the diode conducts when a) $V_{in} < V_{ref}$ **b) $V_{in} = V_{ref}$** c) $V_{in} > V_{ref}$ d) None of the mentioned
27	A circuit with a predetermined dc level is added to the output voltage of the op-amp is called **a) Clamper** b) Positive clipper c) Halfwave rectifier d) None of the mentioned
28	An op-amp clamper circuit is also referred as a) DC cutter **b) DC inserter** c) DC lifter d) DC leveller
29	Determine the output from the following circuit  a) 180^o in phase with input signal **) 180^o out of phase with input signal** b c) Same as that of input signal d) Output signal cannot be determined
30	Which of the following electrical characteristics is not exhibited by an ideal op-amp? a) Infinite voltage gain b) Infinite bandwidth c) **Infinite output resistance** d) Infinite slew rate

31	Ideal op-amp has infinite voltage gain because a) To control the output voltage b) **To obtain finite output voltage** c) To receive zero noise output voltage d) None of the mentioned
32	What is the function of the Trigger pin in IC 555? A. To charge the capacitor “C” B. To discharge the capacitor “C” C. To detect when the capacitor is “HIGH” **D. To detect when the capacitor is “LOW”**
33	What does pin 6 do in IC 555? A. Charges the capacitor “C” B. Discharges the capacitor “C” **C. Detects the HIGH on capacitor “C”** D. Detects the LOW on capacitor “C”
34	What does pin 2 do in IC 555? A. Charges the capacitor “C” B. Discharges the capacitor “C” **C. Detects the HIGH on capacitor “C”** D. Detects the LOW on capacitor “C”
35	What does pin 7 do in IC 555? A. Charges the capacitor “C” B. **Discharges the capacitor “C”** C. Detects the HIGH on capacitor “C” D. Detects the LOW on capacitor “C”
36	The maximum frequency of operation for a 555 is: A. 100kHz **B. 500kHz** C. 5MHz D. 500Hz
37	Name the CMOS version of the 555 timer. IC 7555.  1. The function of Pin 3 is: A. Control Voltage B. Discharge C. **Output** D. Reset
38	The function of Pin 6 in IC 555 is: A. Control Voltage B. Discharge C. **Threshold** D. Reset

39	The function of Pin 5 in IC 555 is: A. **Control Voltage** B. Discharge C. Output D. Reset
40	The function of Pin 4 in IC 555 is: A. Control Voltage B. Discharge C. Output **D. Reset**
41	What is the function of the Reset pin in IC 555? A. To discharge the capacitor "C" **B. To reset the chip** C. To make the output of the chip "HIGH" D. To make the output of the chip "LOW"
42	What makes the output voltage equals to zero in practical op-amp? a) **Input offset voltage** b) Output offset voltage c) Offset minimizing voltage d) Error voltage
43	Define polarity of the output offset voltage in a practical op-amp? a) Positive polarity b) Negative polarity c) **Positive or negative polarity** d) None of the mentioned
44	Which of the following op-amp does not need compensating network? a) 777 b) 741 c) 748 d) **All of the mentioned**
45	What will the condition of op-amp, before applying any external input a) Compensated b) Biased c) **Balanced** d) Zero
46	A feedback amplifier is also called as a) Open loop amplifier b) **Closed loop amplifier** c) Feedback network amplifier d) Looped network amplifier
47	How many types of configuration are available for feedback amplifier? a) Six b) **Four** c) Two d) Eight
48	Which of the following is not a feedback configuration? a) Current-series feedback b) Voltage-shunt feedback c) **Current-Voltage feedback** c) Current-Shunt feedback

49	When load current flows into the feedback circuit, the configuration is said to be a) Current-shunt feedback b) **Voltage-shunt feedback** c) Voltage-series feedback d) All of the mentioned
50	On what criteria does the feedback amplifier are classified? a) Signal fed back to input b) Signal applied to input c) Signal fed back to output d) **None of the mentioned**

	Unit 6: REGULATED POWER SUPPLIES
1	**In an unregulated power supply, if load current increases, the output voltage ……..** 1. Remains the same **2. Decreases** 3. Increases 4. None of the above
2	**In an unregulated power supply, if input a.c. voltage increases, the output voltage …….** **1. Increases** 2. Decreases 3. Remains the same 4. None of the above
3	**Commercial power supplies have voltage regulation …….** 1. of 10% 2. of 15% 3. of 25% **4. within 1%**
4	**An ideal regulated power supply is one which has voltage regulation of ……** **1. 0%** 2. 5% 3. 10% 4. 1%
5	**A Zener diode utilises …… characteristic for voltage regulation** 1. Forward **2. Reverse** 3. Both forward and reverse 4. None of the above
6	**Zener diode can be used as ……** 1. c. voltage regulator only 2. c. voltage regulator only **3. both d.c. and a.c. voltage regulator**

	4. none of the above
7	**A Zener diode is used as a ……. voltage regulating device** **1. Shunt** 2. Series 3. Series-shunt 4. None of the above
8	**As the junction temperature increases, the voltage breakdown point for Zener mechanism ……** 1. Is increased **2. Is decreased** 3. Remains the same 4. None of the above
9	**In a 15 V Zener diode , the breakdown mechanism will occur by …….** **1. Avalanche mechanism** 2. Zener mechanism 3. Both Zener and avalanche mechanism 4. None of the above
10	**A Zener diode that has very narrow depletion layer will breakdown by …… mechanism** 1. Avalanche **2. Zener** 3. Both avalanche and Zener 4. None of the above
11	**As the junction temperature increases, the voltage breakdown point for avalanche mechanism …….** 1. Remains the same 2. Decrease **3. Increases** 4. None of the above
12	**Another name for Zener diode is …… diode** **1. Breakdown** 2. Voltage 3. Power 4. Current
13	**Zener diode are generally made of …….** 1. Germanium **2. Silicon** 3. Carbon 4. None of the above
14	**For increasing the voltage rating, zeners are connected in ……..** 1. Parallel 2. Series-parallel

	3. Series 4. None of the above
15	**In a Zener voltage regulator, the changes in load current produce changes in …….** **1. Zener current** 2. Zener voltage 3. Zener voltage as well as Zener current 4. None of the above
16	**A Zener voltage regulator is used for ……. load currents** 1. High 2. Very high 3. Moderate **4. Small**
17	**A Zener voltage regulator will cease to act as a voltage regulator if Zener current becomes …….** 1. Less than load current **2. Zero** 3. More than load current 4. None of the above
18	**If the doping level is increased, the breakdown voltage of the Zener ……..** 1. Remains the same 2. Is increased **3. Is decreased** 4. None of the above
19	**A 30 V Zener will have depletion layer width ……. that of 10 V Zener** **1. More than** 2. Less than 3. Equal to 4. None of the above
20	**The current in a Zener diode is limited by ……..** 1. External resistance 2. Power dissipation **3. Both (1) and (2)** 4. None of the above
21	**What is true about the breakdown voltage in a Zener diode?** 1. It decreases when load current increases 2. It destroys the diode 3. It equals current times the resistance **4. It is approximately constant**
22	**Which of these is the best description for a Zener diode?** 1. It is a diode

	2. It is a constant current device **3. It is a constant-voltage device** 4. It works in the forward region
23	**A Zener diode ……..** 1. Is a battery **2. Acts like a battery in the breakdown region** 3. Has a barrier potential of 1 V 4. Is forward biased
24	**The load voltage is approximately constant when a Zener diode is …….** 1. Forward biased 2. Unbiased 3. Reverse biased **4. Operating in the breakdown region**
25	**In a loaded Zener regulator, which is the largest Zener current?** **1. Series current** 2. Zener current 3. Load current 4. None of the above
26	**If the load resistance decreases in a Zener regulator, then Zener current …….** **1. Decreases** 2. Stays the same 3. Increases 4. None of the above
27	**If the load current drawn by unregulated power supply increases, the d.c. output voltage ……..** 1. Increases **2. Decreases** 3. Stays the same 4. None of the above
28	**If the load current drawn by unregulated power supply increases, the d.c. output voltage ……** 1. Increases **2. Decreases** 3. Stays the same 4. None of the above
29	**Two similar 15 V Zeners are connected in series. What is the regulated output voltage?** 1. 15 V 2. 5 V **3. 30 V** 4. 45 V

30	**A Zener regulator …… in the power supply** 1. Increases the ripple **2. Decreases the ripple** 3. Neither increases nor decreases the ripple 4. Data insufficient
31	**When load current is zero, the Zener current will be ……** 1. Zero 2. Minimum **3. Maximum** 4. None of the above
32	**The Zener current will be minimum when ……** **1. Load current is maximum** 2. Load current is minimum 3. Load current is zero 4. None of the above
33	SMPS is used for a) obtaining controlled ac power supply b) **obtaining controlled dc power supply** c) storage of dc power d) switch from one source to another
34	SPMS are based on the _____ principle. a) Phase control b) Integral control **c) Chopper** d) MOSFET
35	Choose the incorrect statement. a) SMPS is less sensitive to input voltage variations b) SMPS is smaller as compared to rectifiers c) **SMPS has low input ripple** d) SMPS is a source of radio interference
36	Which is not considered as a linear voltage regulator? a) Fixed output voltage regulator b) Adjustable output voltage regulator c) **Switching regulator** d) Special regulator
37	What is the dropout voltage in a three terminal IC regulator? a) $\mathbf{\lvert V_{in}\rvert \geq \lvert V_o\rvert + 2v}$ b) $\lvert V_{in}\rvert < \lvert V_o\rvert - 2v$ c) $\lvert V_{in}\rvert = \lvert V_o\rvert$ d) $\lvert V_{in}\rvert \leq \lvert V_o\rvert$
38	To get a maximum output current, IC regulation are provided with a) Radiation source b) **Heat sink** c) Peak detector d) None of the mentioned
39	Which type of regulator is considered more efficient? a) All of the mentioned

	b) Special regulator c) Fixed output regulator d) **Switching regulator**
40	State the reason for thermal shutdown of IC regulator? a) Spikes in temperature b) Decrease in temperature c) Fluctuation in temperature d) **Increase in temperature**
41	The change in output voltage for the corresponding change in load current in a 7805 IC regulator is defined as a) All of the mentioned b) Line regulation c) **Load regulation** d) Input regulation
42	Which of the following is not a characteristic of adjustable voltage regulators? a) **Non-versatile** b) Better performance c) Increased reliability d) None of the mentioned
43	**In LM317 voltage regulator, what is the minimum value of voltage required between its input & output in order to supply power to an internal circuit?** **a.** 1V **b. 3V** **c.** 5V **d.** 10V
44	**Which among the following are regarded as three-pin voltage regulator ICs?** **a.** Fixed voltage regulators **b.** Adjustable voltage regulators **c. Both a and b** **d.** None of the above
45	**Due to operation of series pass transistor in an active region of linear voltage regulator, _____** **a.** The ripple contents in o/p voltage waveform is very low **b.** Then there is no necessity of using high speed transitor **c. Both a and b** **d.** None of the above
46	**Which type of IC voltage regulator exhibits continuous variation in the impedance of transistor in order to supply the desired load current?** **a. Linear regulators** **b.** Switching regulators **c.** Both a and b **d.** None of the above
47	**In LM317 voltage regulator, the protective diodes do not allow the filter capacitors to discharge through _____current points.** **a.** High **b. Low** **c.** Both a and b **d.** None of the above
48	**In a linear IC voltage regulator, series pass transistor always operates in _____ region.**

	a. Active **b.** Saturation **c.** Cut-off **d.** All of the above
49	**Switching regulators are series type regulators, which has _____ power dissipation & _____ efficiency.** **a.** increased, increased **b.** increased, reduced **c. reduced, increased** **d.** reduced, reduced
50	**Which among the following factors affect/s the output voltage of a regulated power supply?** **a.** Load current **b.** Input voltage **c.** Temperature **d. All of the above**