



**Maratha Vidya Prasarak Samaj's**

**Rajarshi Shahu Maharaj Polytechnic, Nashik**

**Udoji Maratha Boarding Campus, Near Pumping Station, Gangapur Road, Nashik-13.**

**Affiliated to MSBTE Mumbai, Approved by AICTE New Delhi, DTE Mumbai & Govt. of Maharashtra, Mumbai.**

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***Subject :- Applied Electronics  
( 22329 )***



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# SYLLABUS

<b>Chapter No.</b>	<b>Name of chapter</b>	<b>Marks With Option</b>
<b>1</b>	<b>Low power Amplifier</b>	<b>20</b>
<b>2</b>	<b>High Power Amplifier</b>	<b>22</b>
<b>3</b>	<b>Feedback Amplifier</b>	<b>20</b>
<b>4</b>	<b>Waveform Generation</b>	<b>19</b>
<b>5</b>	<b>IC voltage regulators and SMPS</b>	<b>19</b>
<b>Total Marks :-</b>		<b>100</b>



# **BOARD THEORY PAPER**

## **PATTERN**

### **FOR AEL(22329)**

<b>Q.1</b>		<b>Attempt any FIVE</b>	<b>5*2=10</b>
	<b>a)</b>	State classification of Amplifiers.	
	<b>b)</b>	Define the terms related to tuned amplifier. (i) Resonant Frequency (Fr) (ii) Q Factor	
	<b>c)</b>	State the need of multistage amplifier.	
	<b>d)</b>	List the types of power amplifiers.	
	<b>e)</b>	List advantages of negative feedback (any four)	
	<b>f)</b>	Define :(i) Sweep time (ii) Retrace time.	
	<b>g)</b>	State fixed voltage regulator IC'S.	
<b>Q.2</b>		<b>Attempt any THREE</b>	<b>3*4=12</b>
	<b>a)</b>	Sketch circuit diagram of RC coupled single stage CE amplifier. State the function of each component.	
	<b>b)</b>	Describe the working of single stage class A amplifier with circuit diagram.	
	<b>c)</b>	Explain principle of feedback amplifier.	
	<b>d)</b>	Draw circuit diagram of RC phase shift oscillator and state its working.	
<b>Q.3</b>		<b>Attempt any THREE</b>	<b>3*4=12</b>
	<b>a)</b>	Sketch circuit diagram of common source FET Amplifier. State working principle of it.	
	<b>b)</b>	Explain the term crossover distortion. State methods to overcome it.	
	<b>c)</b>	Compare positive feedback and negative feedback on the basis of:(i) Gain(ii)Bandwidth(iii) Phase shift(iv) Stability	



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	d)	Draw block diagram of SMPS. State its working principle.
<b>Q.4</b>		<b>Attempt any FOUR</b> <span style="float: right;"><b>3*4=12</b></span>
	a)	Calculate Resonant frequency of single tuned amplifier, if inductor $L = 10\text{mH}$ and capacitor $C = 4.7\text{ mf}$ of tank circuit.
	b)	An amplifier has gain 'A' of 300 without feedback, output impedance is $1\text{KW}$ . If negative feedback with feedback factor 0.03 is introduced in the circuit then calculate the gain with feedback and output impedance of this feedback amplifier.
	c)	Describe miller sweep generator circuit with neat input output waveforms.
	d)	Draw block diagram of IC 723 regulator. State the working principle of IC 723.
	e)	Compare RC coupled, transformer coupled, direct coupled amplifier on the basis of:(i) Type of coupling(ii) Frequency response(iii) Gain(iv) Application
<b>Q.5</b>		<b>Attempt any TWO</b> <span style="float: right;"><b>2*6=12</b></span>
	a)	Compare class A, class B, class AB, and class C amplifier.
	b)	i) List different types of feedback amplifiers. ii)List the advantages of negative feedback over positive feedback.
	c)	i)Compare amplifier and oscillator. ii)State use of heat sink.
<b>Q.6</b>		<b>Attempt any Two</b> <span style="float: right;"><b>2*6=12</b></span>
	a)	i)Explain with sketch the working of class B push pull amplifier. ii)Draw miller sweep generation and give its applications.
	b)	i)Explain the working principle of crystal oscillator with diagram. ii)Describe with help of circuit diagram working of class A power amplifier
	c)	Sketch the circuit diagram for dual voltage regulator using IC 78XX and 79XX to obtain $\pm 12\text{ V}$ output and explain.

# CLASS TEST - I

## PAPER PATTERN

**COURSE: - Applied Electronics (22329) PROGRAMME: - E & TC Engineering**

**Syllabus: -**

Unit No.	Name of the Unit	Course Outcome (CO)
1	Low power Amplifier	CO-329.1
2	High Power Amplifier	CO-329.2
3	Feedback Amplifier	CO-329.3

Q.	Attempt any FOUR 4*2=8Marks	Course Outcome (CO)
1		
a)	What are different types of amplifier coupling?	CO-329.1
b)	Define efficiency of power amplifier.	CO-329.2
c)	What is crossover distortion?	CO-329.2
d)	Draw single tuned RF amplifier.	CO-329.1
e)	What is feedback? List its types.	CO-329.3
f)	Explain effect of coupling, bypass capacitor on Bandwidth.	CO-329.1
Q.	Attempt any THREE 3*4=12 Marks	
2		
a)	Draw single stage CE amplifier and explain its working.	CO-329.1
b)	Compare class A, class B, class AB, and class C amplifier.	CO-329.2
c)	Draw and explain block diagram of voltage series feedback.	CO-329.3
d)	Draw class A push pull amplifier and describe its operation.	CO-329.2



# CLASS TEST - II

## PAPER PATTERN

COURSE: - Applied Electronics (22329) PROGRAMME: - E & TC Engineering

Syllabus: -

Unit No.	Name of the Unit	Course Outcome (CO)
3	Feedback Amplifier	CO-329.3
5	Waveform Generators	CO-329.4
6	IC voltage regulators and SMPS	CO-329.5

Q.1	Attempt any FOUR $4*2=8$ Marks	Course Outcome (CO)
a)	Draw block diagram of regulated power supply.	CO-329.5
b)	State the barkhausen criteria	CO-329.4
c)	State important features of IC 317	CO-329.5
d)	Draw crystal oscillator.	CO-329.4
e)	Give disadvantages of negative feedback.	CO-329.3
f)	Draw time base generator diagram.	CO-329.4
Q.2	Attempt any THREE $3*4=12$ Marks	
a)	Explain working SMPS with neat diagram	CO-329.5
b)	Draw labelled RC phase shift oscillator and explain.	CO-329.4
c)	Draw emitter follower using transistor and justify type of f/b.	CO-329.3
d)	Draw and explain bootstrap generator.	CO-329.4



## **COURSE OUTCOME (CO)**

**COURSE: -APPLIED ELECTRONICS (22329)**

**PROGRAMME: -E&TC**

<b>CO.NO</b>	<b>Course Outcome</b>
<b>CO-329.1</b>	Use transistor as low power amplifier.
<b>CO-329.2</b>	Use BJT as high power amplifier.
<b>CO-329.3</b>	Use BJT as feedback amplifier.
<b>CO-329.4</b>	Use BJT as waveform generator.
<b>CO-329.5</b>	Maintain IC voltage regulator and SMPS





## 1.Low Power Amplifier

Position in Question Paper

Total Marks-16

Q.1 a) 2-Marks.

Q.1 b) 2-Marks.

Q.1 c) 2-Marks.

Q.2 a) 4-Marks.

Q.3 a) 4-Marks.

Q.4 a) 4-Marks.

Q.4 b) 4-Marks.

### Descriptive Question

1. What are different types of coupling in amplifier
2. Give classification of amplifier draw single stage RC coupled CE amplifier
3. Draw single tuned RF amplifier
4. Explain the effect of coupling, bypass capacitance on bandwidth
5. Draw transformer coupled RF amplifier
6. Draw and explain single stage CE amplifier
7. Draw frequency response and bandwidth of CE amplifier.
8. What is need of multistage amplifier and draw two stage CE amplifier.
9. Compare RC coupled amplifier and direct coupled amplifier.
10. Draw and explain double tuned amplifier along with it's frequency response
11. What is neutralization in RF tuned amplifier and it's advantages.
12. Compare single, double and stagger tuned amplifier





## MCQ Question

(Total number of Question=Marks\*3=16\*3=48)

Note: Correct answer is marked with **bold**

1. A single stage transistor amplifier contains \_\_\_\_\_ and associated circuitry
  - a) Two transistors
  - b) One transistor**
  - c) Three transistor
  - d) None of the above
2. The phase difference between the output and input voltages of a CE amplifier is \_\_\_\_\_
  - a) 180°**
  - b) 0°
  - c) 90°
  - d) 270°
3. It is generally desired that a transistor should have \_\_\_\_\_ input impedance
  - a) Low
  - b) Very low
  - c) High**
  - d) Very high
4. When an a.c. signal is applied to an amplifier, the operating point moves along \_\_\_\_
  - a) d.c. load line
  - b) a.c. load line**
  - c) both d.c. and a.c. load lines
  - d) none of the above
5. If the collector supply is 10V, then collector cut off voltage under d.c. conditions is \_\_\_\_
  - a) 20 V
  - b) 5 V
  - c) 2 V
  - d) 10 V**
6. In the zero signal conditions, a transistor sees \_\_\_\_ load
  - a) d.c.**
  - b) a.c.
  - c) both d.c. and a.c.
  - d) none of the above
7. The input capacitor in an amplifier is the \_\_\_\_ capacitor
  - a) Coupling**
  - b) Bypass
  - c) Leakage
  - d) None of the above
8. The point of intersection of d.c. and a.c. load lines is called \_\_\_\_
  - a) Saturation point
  - b) Cut off point
  - c) Operating point**
  - d) None of the above
9. The slope of a.c. load line is \_\_\_\_ that of d.c. load line
  - a) The same as
  - b) More than**
  - c) Less than
  - d) None of the above
10. The purpose of capacitors in a transistor amplifier is to \_\_\_\_
  - a) Protect the transistor
  - b) Cool the transistor
  - c) Couple or bypass a.c. component**
  - d) Provide biasing
13. In the d.c. equivalent circuit of a transistor amplifier, the capacitors are considered \_\_\_\_
  - a) Short
  - b) Open**
  - c) Partially short
  - d) None of the above
14. In a CE amplifier, voltage gain = \_\_\_\_\_ x  $R_{AC}/R_{in}$ 
  - a)  $\alpha$
  - b)  $(1 + \alpha)$
  - c)  $(1 + \beta)$
  - d) B**
15. In practice, the voltage gain of an amplifier is expressed \_\_\_\_
  - a) As volts
  - b) As a number



- c) **In db** d) None of the above
16. If  $R_C$  and  $R_L$  represent the collector resistance and load resistance respectively in a single stage transistor amplifier, then a.c. load is \_\_\_\_
- a)  $R_L + R_C$  c)  $R_L - R_C$   
b)  $R_C \parallel R_L$  d)  $R_C$
17. In a CE amplifier, the phase difference between voltage across collector load  $R_C$  and signal voltage is \_\_\_\_
- a)  $180^\circ$  c)  $90^\circ$   
b)  $270^\circ$  d)  $0^\circ$
18. In the a.c. equivalent circuit of a transistor amplifier, the capacitors are considered .....
- a) **Short** c) Partially open  
b) Open d) None of the above
19. The purpose of d.c. conditions in a transistor is to \_\_\_\_
- a) Reverse bias the emitter c) **Set up operating point**  
b) Forward bias the collector d) None of the above
20. An amplifier has a power gain of 100. Its db gain is \_\_\_\_
- a) 10 db c) 40 db  
b) **20 db** d) None of the above
21. In order to get more voltage gain from a transistor amplifier, the transistor used should have \_\_\_\_
- a) **Thin base** c) Wide emitter  
b) Thin collector d) None of the above
22. The purpose of a coupling capacitor in a transistor amplifier is to \_\_\_\_
- a) Increase the output impedance of transistor  
b) Protect the transistor  
c) **Pass a.c. and block d.c.**  
d) Provide biasing
23. The purpose of emitter capacitor (i.e. capacitor across  $R_E$ ) is to \_\_\_\_
- a) **Avoid voltage gain drop** c) Reduce noise in the amplifier  
b) Forward bias the emitter d) None of the above
24. If the input capacitor of a transistor amplifier is short-circuited, then \_\_\_\_
- a) Transistor will be destroyed c) Signal will not reach the base  
b) **Biasing conditions will change** d) None of the above
25. A CE amplifier is also called \_\_\_\_ circuit
- a) **Grounded emitter** c) Grounded collector  
b) Grounded base d) None of the above
26. In transistor amplifiers, we generally use \_\_\_\_ capacitors.
- a) **Electrolytic** c) Paper  
b) Mica d) Air
27. The output power of a transistor amplifier is more than the input power because the additional power is supplied by \_\_\_\_



- a) Transistor  
b) Biasing circuit
28. A transistor converts \_\_\_\_\_  
**a) d.c. power into a.c. power**  
b) a.c. power into d.c. power
29. A transistor amplifier has high output impedance because \_\_\_\_\_  
a) Emitter is heavily doped  
**b) Collector has reverse bias**  
c) Collector is wider than emitter or base  
d) None of the above
30. For highest power gain, one would use \_\_\_\_\_ configuration  
a) CC  
b) CB  
**c) CE**  
d) none of the above
31. CC configuration is used for impedance matching because its \_\_\_\_\_  
**a) Input impedance is very high**  
b) Input impedance is low  
c) Output impedance is very low  
d) None of the above
32. A coupling capacitor is  
a) A DC short  
b) An AC open  
c) A DC open and an AC short  
**d) A DC short and an AC open**
33. In a bypass circuit, the top of a capacitor is  
a) An open  
b) A short  
**c) An AC ground**  
d) A mechanical ground
34. The capacitor that produces an AC ground called a  
**a) Bypass capacitor**  
b) Coupling capacitor  
c) DC open  
d) AC open
35. The capacitor of a CE amplifier appear to be  
a) Open to AC  
b) Shorted to AC  
c) Open to supply voltage  
**d) Shorted to AC**
36. A single stage transistor amplifier contains \_\_\_\_\_ and associated circuitry.  
a) Two transistors  
**b) One transistor**  
c) Three transistors  
d) None of the above
37. The phase difference between the output and input voltages of a CE amplifier is  
**a) 180°**  
b) 0°  
c) 90°  
d) 270°
38. It is generally desired that a transistor should have \_\_\_\_\_ input impedance  
a) Low  
b) Very low  
**c) High**  
d) Very high
39. When an AC signal is applied to an amplifier, the operating point moves along \_\_\_\_\_  
a) DC load line  
**b) AC load line**  
c) Both DC and AC load lines  
d) None of the above
40. The input capacitor in an amplifier is the \_\_\_\_\_ capacitor.  
**a) Coupling**  
b) Bypass



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- c) Leakage  
41. The slope of AC load line is \_\_\_\_\_ that of DC load line  
a) The same as  
**b) More than**  
42. To reduce the distortion of an amplifier signal, you can increase the  
a) Collector resistance  
**b) Emitter feedback resistance**  
43. If the emitter-bypass capacitor opens, the AC output voltage will  
**a) Decreases**  
b) Increases  
44. If the emitter-bypass capacitor shorts, the base DC voltage will  
**a) Decreases**  
b) Increases  
45. When negative voltage feedback is applied to an amplifier, its voltage gain .....  
a) Is increased  
**b) Is reduced**  
46. The value of negative feedback fraction is always \_\_\_\_  
**a) Less than 1**  
b) More than 1  
47. A feedback circuit usually employs \_\_\_\_ network  
**a) Resistive**  
b) Capacitive  
48. The gain of an amplifier with feedback is known as \_\_\_\_\_ gain  
a) Resonant  
**c) Closed loop**  
b) Open loop  
d) None of the above  
c) Less than  
d) None of the above  
c) Generator resistance  
d) Load resistance  
c) Remains the same  
d) Equals zero  
c) Remains the same  
d) Equals zero  
c) Remains the same  
d) None of the above  
c) Equal to 1  
d) None of the above  
c) Inductive  
d) None of the above  
d) None of the above



## 2. High Power Amplifier

Position in Question Paper

Total Marks-18

Q.1. d) 2-Marks.

Q.2. b) 4-Marks.

Q.5. b) 6-Marks.

Q.6. a) 3-Marks

Q.6. c) 3-Marks

### Descriptive Question

1. Define efficiency of power amplifier
2. What is cross over distortion
3. Draw direct coupled class A amplifier
4. Give classification of power amplifier
5. Draw complementary symmetry class AB amplifier
6. Compare class A, B, AB, and C amplifier
7. Draw and explain class B push pull amplifier
8. Explain class C amplifier with neat diagram.
9. Describe why efficiency of class C amplifier is higher than other amplifier\
10. Draw and explain class AB push pull amplifier

### MCQ Question

(Total number of Question=Marks\*3=18\*3=54)

Note: Correct answer is marked with **bold**

1. The output stage of a multistage amplifier is also called \_\_\_\_  
a) Mixer stage  
**b) Power stage**  
c) Detector stage  
d) F stage
2. \_\_\_\_ coupling is generally employed in power amplifiers  
**a) Transformer**  
b) RC  
c) direct  
d) Impedance
3. A class A power amplifier uses \_\_\_\_  
a) Two transistors  
**c) One transistor**  
b) Three transistors  
d) None of the above
4. The maximum efficiency of resistance loaded class A power amplifier is \_\_\_\_  
a) 5%  
**b) 50%**





- c) 30% **d) 25%**
5. The maximum efficiency of transformer coupled class A power amplifier is \_\_\_\_  
a) 30% c) 80%  
**b) 50%** d) 45%
6. Class \_\_\_\_ power amplifier has the highest collector efficiency  
a) C c) B  
b) A d) AB
7. Power amplifiers handle \_\_\_\_ signals compare to voltage amplifiers  
a) Small **c) Large**  
b) Very small d) None of the above
8. In class A operation, the operating point is generally located \_\_\_\_ of the d.c. load line.  
a) At cut off point c) At saturation point  
**b) At the middle** d) None of the above
9. Class C amplifiers are used as \_\_\_\_  
a) AF amplifiers **c) F. amplifiers**  
b) Detectors d) None of the above
10. A power amplifier has comparatively \_\_\_\_  $\beta$   
a) **Small** c) Very large  
b) Large d) None of the above
11. The maximum collector efficiency of class B operation is \_\_\_\_  
a) 50% c) 55%  
b) 90% **d) 78.5%**
12. A 2-transistor class B power amplifier is commonly called \_\_\_\_ amplifier  
a) Dual c) Symmetrical  
**b) Push-pull** d) Differential
13. If a transistor is operated in such a way that output current flows for 60° of the input signal, then it is \_\_\_\_ operation  
a) Class A **c) Class C**  
b) Class B d) None of the above
14. When a transistor is cut off \_\_\_\_  
**a) Maximum voltage appears across transistor**  
b) Maximum current flows  
c) Maximum voltage appears across load  
d) None of the above
15. A class A power amplifier is sometimes called \_\_\_\_ amplifier  
a) Symmetrical c) Reciprocating  
**b) Single-ended** d) Differential
16. Class \_\_\_\_ operation gives the maximum distortion  
a) A **c) C**  
b) B d) AB
17. The output stage of a multistage amplifier usually employs \_\_\_\_  
**a) Push-pull amplifier** c) Class A power amplifier  
b) Preamplifier d) None of the above



18. Low efficiency of a power amplifier results in \_\_\_\_\_
- a) Low forward bias
  - b) Less battery consumption
  - c) **More battery consumption**
  - d) None of the above
19. The driver stage usually employs \_\_\_\_\_
- a) **Class A power amplifier**
  - b) Push-pull amplifier
  - c) Class C amplifier
  - d) None of the above
20. If the power rating of a transistor is 1W and collector current is 100mA, then maximum allowable collector voltage is \_\_\_\_\_
- a) 1V
  - b) 100V
  - c) 20V
  - d) **10V**
21. When no signal is applied, the approximate collector efficiency of class A power amplifier is \_\_\_\_\_
- a) 10%
  - b) **0%**
  - c) 25%
  - d) 50%
22. What will be the collector efficiency of a power amplifier having zero signal power dissipation of 5 watts and a.c. power output of 2 watts?
- a) 20%
  - b) 80%
  - c) **40%**
  - d) 50%
23. The output signal voltage and current of a power amplifier are 5V and 200 mA; the values being r.m.s. What is the power output?
- a) **1 W**
  - b) 2 W
  - c) 4 W
  - d) None of the above
24. The maximum a.c. power output from a class A power amplifier is 10 W. What should be the minimum power rating of the transistor used ?
- a) 10 W
  - b) 15 W
  - c) 5 W
  - d) **20 W**
25. For the same a.c. power output as above, what should be the minimum power rating of transistor for class B operation?
- a) 10 W
  - b) **4 W**
  - c) 8 W
  - d) None of the above
26. The push-pull circuit must use \_\_\_\_\_ operation
- a) Class A
  - b) Class C
  - c) **Class B**
  - d) Class AB
27. The class B push-pull circuit can deliver 100 W of a.c. output power. What should be the minimum power rating of each transistor?
- a) **20 W**
  - b) 40 W
  - c) 10 W
  - d) 80 W
28. Power amplifiers generally use transformer coupling because transformer permits \_\_\_\_\_
- a) Cooling of the circuit
  - b) **Impedance matching**
  - c) Distortionless output
  - d) Good frequency response
29. Transformer coupling can be used in \_\_\_\_\_ amplifiers
- a) **Either power or voltage**
  - b) Only power
  - c) Only voltage
  - d) None of the above





30. The output transformer used in a power amplifier is a \_\_\_\_\_ transformer  
a) 1:1 ratio  
b) Step-up  
c) **Step-down**  
d) None of the above
31. The most important consideration in power amplifier is \_\_\_\_\_  
a) Biasing the circuit  
b) **Collector efficiency**  
c) To keep the transformer cool  
d) None of the above
32. An AF amplifier is shielded to \_\_\_\_\_  
a) Keep the amplifier cool  
b) Protect from rusting  
c) **Prevent induction due to stray magnetic fields**  
d) None of the above
33. The pulsating d.c. applied to power amplifier causes \_\_\_\_\_  
a) Burning of transistor  
b) **Hum in the circuit**  
c) Excessive forward voltage  
d) None of the above
34. The disadvantage of impedance matching is that it \_\_\_\_\_  
a) **Gives distorted output**  
b) Gives low power output  
c) Requires a transformer  
d) None of the above
35. If the gain versus frequency curve of a transistor amplifier is not flat, then there is distortion.  
a) Amplitude  
b) Intermodulation  
c) **Frequency**  
d) None of the above
36. The most costly coupling is \_\_\_\_\_ coupling  
a) RC  
b) Direct  
c) Impedance  
d) **Transformer**
37. Which type of power amplifier is biased for operation at less than  $180^\circ$  of the cycle?  
a) Class A  
b) Class B or AB  
c) **Class C**  
d) Class D
38. Class AB operation is \_\_\_\_\_ operation  
a) similar to class A  
b) similar to class B  
c) similar to class C  
d) None of the above
39. In class B operation, at what fraction of  $V_{CC}$  should the level of  $V_L(p)$  be to achieve the maximum power dissipated by the output transistor?  
a) 0.5  
b) **0.636**  
c) 0.707  
d) 1
40. What is the maximum efficiency of a class A circuit with a direct or series-fed load connection?  
a) 90%  
b) 78.5%  
c) 50%  
d) **25%**
41. Which class of amplifier operates in the linear region for only a small part of the input cycle?  
a) A  
b) B  
c) **C**  
d) AB



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42. The Q-point is at cutoff for class \_\_\_\_\_ operation  
a) A c) C  
b) B d) AB
43. How many transistors must be used in a class B power amplifier to obtain the output for the full cycle of the signal?  
a) 0 c) 2  
b) 1 d) 3
44. Which of the following is (are) power amplifiers?  
a) Class A c) Class C or D  
b) Class B or AB d) **All of the above**
45. Which of the power amplifiers is not intended primarily for large-signal or power amplification?  
a) Class A c) **Class C**  
b) Class B or AB d) Class D
46. By how much does the output signal vary for a class AB power amplifier?  
a) 360° c) Between 180° and 360°  
b) 180° d) Less than 180°
47. Which of the following describe(s) a power amplifier?  
a) It can handle large power. c) It does not provide much voltage gain  
b) It can handle large current. d) **All of the above**
48. The feedback resistor  
a) Increases voltage gain c) Decreases collector resistance  
b) **Reduces distortion** d) Decreases input impedance
49. In an LC transistor oscillator, the active device is \_\_\_\_\_  
a) LC tank circuit c) **Transistor**  
b) Biasing circuit d) None of the above
50. Permanent Magnetic speakers commonly used in \_\_\_\_\_  
a) Radio signal Tower c) Transformer  
b) **Radio** d) **All of the above**
51. In an LC circuit, when the capacitor is maximum, the inductor energy is \_\_\_\_\_  
a) **Minimum**  
b) Maximum  
c) Half-way between maximum and minimum  
d) None of the above
52. The Q-point is above cutoff or above x axis for class \_\_\_\_\_ operation  
a) A c) C  
b) B d) **AB**
53. The class B push-pull circuit can deliver 100 W of a.c. output power. What should be the minimum power rating of each transistor?  
a) **20 W** c) 10 W  
b) 40 W d) 80 W



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54. The most costly coupling is \_\_\_\_\_ coupling

a) RC

b) Direct

c) Impedance

**d) Transformer**



## 3. Feedback Amplifier

Position in Question Paper

Total Marks-12

Q.1.e) 2-Marks.

Q.2.a) 4-Marks.

Q.3.d) 4-Marks.

Q.4.b) 4-Marks.

### Descriptive Question

1. What is feedback?
2. What are types of feedback?
3. What is sampling and mixing wrt amplifier
4. What is effect of negative feedback on gain and bandwidth?
5. Draw and explain block diagram of voltage series feedback
6. Draw and explain voltage shunt feedback
7. Draw and explain voltage series feedback
8. What is effect of negative feedback on input and output resistance
9. Draw and explain current shunt feedback
10. Draw and explain current series feedback
11. Which type of feedback present in emitter follower amplifier? Justify
12. Give example of current series feedback and justify it



## MCQ Question

(Total number of Question=Marks\*3=12\*3=36)

Note: Correct answer is marked with **bold**

1. When negative voltage feedback is applied to an amplifier, its voltage gain \_\_\_\_  
a) Is increased  
**b) Is reduced**  
c) Remains the same  
d) None of the above
2. The value of negative feedback fraction is always \_\_\_\_  
a) **Less than 1**  
b) More than 1  
c) Equal to 1  
d) None of the above
3. A feedback circuit usually employs \_\_\_\_ network  
a) **Resistive**  
b) Capacitive  
c) Inductive  
d) None of the above
4. The gain of an amplifier with feedback is known as \_\_\_\_ gain  
a) Resonant  
b) Open loop  
**c) Closed loop**  
d) None of the above
5. When voltage feedback (negative) is applied to an amplifier, its input impedance \_\_\_\_.  
a) Is decreased  
**b) Is increased**  
c) Remains the same  
d) None of the above
6. When current feedback (negative) is applied to an amplifier, its input impedance \_\_\_\_  
a) **Is decreased**  
b) Is increased  
c) Remains the same  
d) None of the above
7. Negative feedback is employed in \_\_\_\_  
a) Oscillators  
b) Rectifiers  
**c) Amplifiers**  
d) None of the above
8. Emitter follower is used for \_\_\_\_  
a) Current gain  
**b) Impedance matching**  
c) Voltage gain  
d) None of the above
9. The voltage gain of an emitter follower is \_\_\_\_  
a) Much less than 1  
**b) Approximately equal to 1**  
c) Greater than 1  
d) None of the above
10. When current feedback (negative) is applied to an amplifier, its output impedance \_\_\_\_  
a) **Is increased**  
b) Is decreased  
c) Remains the same  
d) None of the above
11. Emitter follower is a \_\_\_\_ circuit  
a) Voltage feedback  
**b) Current feedback**  
c) Both voltage and current feedback  
d) None of the above
12. If voltage feedback (negative) is applied to an amplifier, its output impedance \_\_\_\_  
a) Remains the same  
b) Is increased  
**c) Is decreased**  
d) None of the above
13. When a negative voltage feedback is applied to an amplifier, its bandwidth \_\_\_\_  
a) **Is increased**  
b) Is decreased  
c) Remains the same  
d) Insufficient data



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14. An emitter follower has \_\_\_\_\_ input impedance  
a) Zero  
b) Low  
c) **High**  
d) None of the above
15. The output impedance of an emitter follower is \_\_\_\_\_  
a) High  
b) Very high  
c) Almost zero  
d) **Low**
16. The gain of an amplifier with feedback is known as \_\_\_\_\_ gain  
a) Resonant  
b) Open loop  
c) **Closed loop**  
d) None of the above
17. A Negative-feedback amplifier is an \_\_\_\_\_ amplifier.  
a) Magnetic  
b) **Electronic**  
c) Electromagnetic  
d) None of the above
18. The voltage gain of an emitter follower is \_\_\_\_\_  
a) Much less than 1  
b) **Approximately equal to 1**  
c) Greater than 1  
d) None of the above
19. The output impedance of an emitter follower is \_\_\_\_\_  
a) High  
b) Very high  
c) Almost zero  
d) **Low**
20. Emitter follower is used for \_\_\_\_\_  
a) Current gain  
b) **Impedance matching**  
c) Voltage gain  
d) None of the above
21. If the feedback fraction of an amplifier is 0.01, then voltage gain with negative feedback is approximately \_\_\_\_\_  
a) 500  
b) **100**  
c) 1000  
d) 5000
22. Emitter follower is a \_\_\_\_\_ circuit  
a) Voltage feedback  
b) **Current feedback**  
c) Both voltage and current feedback  
d) None of the above
23. When a negative voltage feedback is applied to an amplifier, its bandwidth \_\_\_\_\_  
a) **Is increased**  
b) Insufficient data  
c) Is decreased  
d) Remains the same
24. When current feedback (negative) is applied to an amplifier, its input impedance \_\_\_\_\_  
a) Remains the same  
b) **Is decreased**  
c) Is increased  
d) None of the above
25. The value of negative feedback fraction is always \_\_\_\_\_  
a) **Less than 1**  
b) More than 1  
c) Equal to 1  
d) None of the above
26. An emitter follower has \_\_\_\_\_ input impedance  
a) Zero  
b) Low  
c) **High**  
d) None of the above
27. If voltage feedback (negative) is applied to an amplifier, its output impedance \_\_\_\_\_  
a) Remains the same  
b) Is increased  
c) **Is decreased**  
d) None of the above





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28. When current feedback (negative) is applied to an amplifier, its output impedance \_\_\_\_\_  
a) **Is increased** c) Remains the same  
b) Is decreased d) None of the above
29. Negative feedback is employed in \_\_\_\_\_  
a) **Amplifiers** c) Oscillators  
b) Rectifiers d) None of the above
30. When voltage feedback (negative) is applied to an amplifier, its input impedance \_\_\_\_\_  
a) **Is increased** c) Remains the same  
b) Is decreased d) None of the above
31. A feedback circuit usually employs \_\_\_\_\_ network  
a) Capacitive c) Inductive  
b) **Resistive** d) None of the above
32. If the output of an amplifier is 10 V and 100 mV from the output is fed back to the input, then feedback fraction is \_\_\_\_\_  
a) 10 c) **0.1**  
b) 1 d) 15
33. When negative voltage feedback is applied to an amplifier, its voltage gain \_\_\_\_\_  
a) Is increased c) Remains the same  
b) **Is reduced** d) None of the above
34. Permanent Magnetic speakers commonly used in \_\_\_\_\_  
a) Radio signal Tower c) Transformer  
b) **Radio** d) **All of the above**
35. The feedback resistor  
a) Increases voltage gain c) Decreases collector resistance  
b) **Reduces distortion** d) Decreases input impedance
36. An emitter follower has \_\_\_\_\_ Output impedance  
a) Zero c) High  
b) **Low** d) None of the above





## 4. Waveform Generation

Position in Question Paper

Total Marks-14

Q.1.c) 2-Marks.

Q.2.d) 4-Marks.

Q.3.c) 4-Marks.

Q.4.c) 4-Marks.

Q.5.c) 3-Marks

### Descriptive Question

1. What is oscillator and draw its block diagram
2. State Barkhausen criterion of oscillation
3. Classify oscillator in brief.
4. Design RC phase shift oscillator
5. Give any four applications of oscillator
6. Draw circuit diagram of crystal oscillator
7. Draw and explain RC phase shift oscillator
8. Draw and explain RC phase shift oscillator using transistor and write formula for frequency
9. Draw and explain crystal oscillator and write its 2 applications
10. Compare amplifier and oscillator
11. Compare RC and crystal oscillator
12. A phase shift oscillator uses equal resistance of 1M $\Omega$  and equal capacitance of 68pF. At what frequency does the circuit oscillate?
13. A phase shift oscillator has  $R=220\Omega$  and  $C=500\text{pF}$ . Calculate the frequency of the sine wave generated by the oscillator.



## MCQ Question

(Total number of Question=Marks\*3=14\*3=42)

Note: Correct answer is marked with **bold**

- An oscillator converts \_\_\_\_\_
  - c. power into d.c. power
  - c. power into a.c. power**
  - mechanical power into a.c. power
  - none of the above
- In an LC transistor oscillator, the active device is \_\_\_\_\_
  - LC tank circuit
  - Biasing circuit
  - Transistor**
  - None of the above
- In an LC circuit, when the capacitor is maximum, the inductor energy is \_\_\_\_\_
  - Minimum**
  - Maximum
  - Half-way between maximum and minimum
  - None of the above
- In an LC oscillator, the frequency of oscillator is \_\_\_\_\_ L or C.
  - Proportional to square of
  - Directly proportional to
  - Independent of the values of
  - Inversely proportional to square root of**
- An oscillator produces \_\_\_\_\_ oscillations
  - Damped
  - Undamped**
  - Modulated
  - None of the above
- An oscillator employs \_\_\_\_\_ feedback
  - Positive**
  - Negative
  - Neither positive nor negative
  - Data insufficient
- An LC oscillator cannot be used to produce \_\_\_\_\_ frequencies
  - High
  - Audio
  - Very low**
  - Very high
- Hartley oscillator is commonly used in \_\_\_\_\_
  - Radio receivers**
  - Radio transmitters
  - TV receivers
  - None of the above
- In a phase shift oscillator, we use \_\_\_\_\_ RC sections
  - Two
  - Three**
  - Four
  - None of the above
- In a phase shift oscillator, the frequency determining elements are \_\_\_\_\_
  - L and C
  - R, L and C
  - R and C**
  - None of the above
- A Wien bridge oscillator uses \_\_\_\_\_ feedback
  - Only positive
  - Only negative
  - Both positive and negative**
  - None of the above
- The piezoelectric effect in a crystal is \_\_\_\_\_
  - A voltage developed because of mechanical stress**



- b) A change in resistance because of temperature  
c) A change in frequency because of temperature  
d) None of the above
13. If the crystal frequency changes with temperature, we say that crystal has \_\_\_\_\_ temperature coefficient  
a) **Positive** c) Negative  
b) Zero d) None of the above
14. The crystal oscillator frequency is very stable due to \_\_\_\_\_ of the crystal  
a) Rigidity c) Low Q  
b) Vibrations d) **High Q**
15. The application where one would most likely find a crystal oscillator is \_\_\_\_\_  
a) Radio receiver c) AF sweep generator  
b) **Radio transmitter** d) None of the above
16. Which of the following signals are generated by Wien-bridge oscillators?  
a) Square wave c) Triangular wave  
b) **Sine wave** d) Pulse wave
17. In a Wien-bridge oscillator for obtaining 160Hz frequency output what will be the capacitor value if resistance is selected as 1K $\Omega$ ?  
a) 10  $\mu$ F c) 1 nF  
b) **1  $\mu$ F** d) 10 nF
18. In a Wien-bridge oscillator, frequency of oscillation and capacitor value has \_\_\_\_\_  
a) Direct proportionality c) Equality  
b) **Inverse proportionality** d) No relation
19. Which of the following device is a non-linear device?  
a) Resistance c) Op-amp  
b) **Diode** d) Capacitor
20. In RC phase shift oscillator, one R-C bridge provides \_\_\_\_\_ phase shift.  
a) 300 c) 900  
b) **600** d) 1800
21. Which of the following oscillators have higher stability at a higher frequency?  
a) Wien-bridge oscillator c) **Crystal oscillator**  
b) RC phase shift oscillator d) All of the mentioned
22. Which of the following can be considered as oscillation frequency controlling element in RC phase shift oscillator?  
a) Resistance c) **Both resistor and capacitor**  
b) Capacitor d) None of the mentioned
23. Which of the following represents the LC tuned circuit?  
a) Wien bridge oscillator c) **Hartley oscillator**  
b) T oscillator d) All of the mentioned
24. Which of the following can be used to produce a square waveform?  
a) Wien bridge oscillators c) Hartley oscillator  
b) T-oscillator d) **Multivibrators**
25. Pulse wave and square wave are the same in all aspect.



- a) True b) False
26. An oscillator converts \_\_\_\_\_
- a) c. power into d.c. power c) mechanical power into a.c. power  
**b) c. power into a.c. power** d) none of the above
27. In an LC oscillator, the frequency of oscillator is \_\_\_\_\_ L or C.
- a) Proportional to square of  
b) Directly proportional to  
c) Independent of the values of  
**d) Inversely proportional to square root of**
28. An LC oscillator cannot be used to produce \_\_\_\_\_ frequencies
- a) High c) Very low  
b) Audio d) Very high
29. In a phase shift oscillator, the frequency determining elements are \_\_\_\_\_
- a) L and C c) R and C  
b) R, L and C d) None of the above
30. The piezoelectric effect in a crystal is \_\_\_\_\_
- a) A voltage developed because of mechanical stress**  
b) A change in resistance because of temperature  
c) A change in frequency because of temperature  
d) None of the above
31. The application where one would most likely find a crystal oscillator is \_\_\_\_\_
- a) Radio receiver c) AF sweep generator  
**b) Radio transmitter** d) None of the above
32. For an oscillator to properly start, the gain around the feedback loop must initially be
- a) 1  
**b) Greater than 1**  
c) Less than 1  
d) Equal to attenuation of feedback circuit
33. The Q of the crystal is of the order of \_\_\_\_\_
- a) 100 c) 50  
b) 1000 **d) More than 10,000**
34. In an LC oscillator, if the value of L is increased four times, the frequency of oscillations is
- a) Increased 2 times c) Increased 4 times  
b) Decreased 4 times **d) Decreased 2 times**
35. Which of the following is not an example for non-sinusoidal oscillator?
- a) Sawtooth Generators c) Multivibrator  
b) Blocking oscillators **d) Crystal oscillators**
36. The sinusoidal oscillator is also called \_\_\_\_\_
- a) LC oscillator c) RC oscillator  
**b) Harmonic oscillator** d) Crystal oscillators
37. Low frequency oscillators have a frequency range of \_\_\_\_\_
- a) 20 Hz-20K Hz c) 1 Hz -20k Hz  
**b) 20 Hz -100k Hz** d) 50 Hz -100k Hz



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38. High frequency oscillators have a frequency range of \_\_\_\_\_
- a) **300K Hz-2G Hz**
  - b) 100k Hz-500k Hz
  - c) 8k Hz-800K Hz
  - d) 4K Hz-1G Hz
39. Which of the following oscillator cannot be used in low frequency oscillations?
- a) Wein bridge oscillators
  - b) RC phase shift oscillators
  - c) **Colpitts oscillators**
  - d) RC oscillators
40. Which of the following oscillator is not using a feedback network for its oscillation?
- a) LC oscillator
  - b) RC oscillator
  - c) Crystal oscillator
  - d) **Relaxation oscillator**
41. The signal generator generally used in the laboratories is \_\_\_\_\_ oscillator
- a) **Wien-bridge**
  - b) Hartely
  - c) Crystal
  - d) Phase shift
42. Quartz crystal is most commonly used in crystal oscillators because \_\_\_\_\_
- a) **It has superior electrical properties**
  - b) It is easily available
  - c) It is quite inexpensive
  - d) None of the above
43. In a Wien-bridge oscillator, if the resistances in the positive feedback circuit are decreased, the frequency \_\_\_\_\_
- a) Remains the same
  - b) Decreases
  - c) **Increases**
  - d) Insufficient data
44. One condition for oscillation is \_\_\_\_\_
- a) A phase shift around the feedback loop of 180o
  - b) A gain around the feedback loop of one-third
  - c) **A phase shift around the feedback loop of 0o**
  - d) A gain around the feedback loop of less than 1
45. In Colpitt's oscillator, feedback is obtained \_\_\_\_\_
- a) By magnetic induction
  - b) By a tickler coil
  - c) **From the centre of split capacitors**
  - d) None of the above
46. \_\_\_\_\_ is a fixed frequency oscillator
- a) Phase-shift oscillator
  - b) Hartely-oscillator
  - c) Colpitt's oscillator
  - d) **Crystal oscillator**
47. An important limitation of a crystal oscillator is .....
- a) **Its low output**
  - b) Its high Q
  - c) Less availability of quartz crystal
  - d) Its high output
48. Which of the following is not an LC oscillator?
- a) Hartley Oscillator
  - b) Colpitts oscillator
  - c) **Crystal oscillator**
  - d) Clapp oscillator
49. Which type of oscillators are used in timing elements?
- a) RC oscillator
  - b) LC oscillator
  - c) **Crystal oscillator**
  - d) None of the above
50. Which of the following oscillator is will give most stable output oscillation frequency?
- a) Colpitts oscillator
  - b) Clapp oscillator
  - c) Wein bridge oscillator
  - d) **Crystal oscillator**
51. A second condition for oscillations is \_\_\_\_\_





- a) **A gain of 1 around the feedback loop**  
b) No gain around the feedback loop  
c) The attention of the feedback circuit must be one-third  
d) The feedback circuit must be capacitive
52. The crystal oscillator frequency is very stable due to \_\_\_\_ of the crystal  
a) Rigidity  
b) Vibrations  
c) Low Q  
d) **High Q**
53. A Wien bridge oscillator uses \_\_\_\_\_ feedback  
a) Only positive  
b) Only negative  
c) **Both positive and negative**  
d) None of the above
54. A Wien bridge oscillator uses \_\_\_\_ feedback  
a) Only positive  
b) Only negative  
c) **Both positive and negative**  
d) None of the above
55. An oscillator differs from an amplifier because it \_\_\_\_  
a) Has more gain  
b) **Requires no input signal**  
c) Requires no d.c. supply  
d) Always has the same input
56. In an LC transistor oscillator, the active device is \_\_\_\_  
a) LC tank circuit  
b) Biasing circuit  
c) **Transistor**  
d) None of the above
57. In an LC circuit, when the capacitor is maximum, the inductor energy is \_\_\_\_  
a) **Minimum**  
b) Maximum  
c) Half-way between maximum and minimum  
d) None of the above
58. An oscillator produces \_\_\_\_ oscillations  
a) Damped  
b) **Undamped**  
c) Modulated  
d) None of the above
59. An oscillator employs \_\_\_\_ feedback  
a) **Positive**  
b) Negative  
c) Neither positive nor negative  
d) Data insufficient
60. Hartley oscillator is commonly used in \_\_\_\_  
a) **Radio receivers**  
b) Radio transmitters  
c) TV receivers  
d) None of the above
61. In a phase shift oscillator, we use \_\_\_\_ RC sections  
a) Two  
b) **Three**  
c) Four  
d) None of the above
62. A time base should have \_\_\_\_\_  
a) non-linearity  
b) ramp relationship  
c) **linearity**  
d) unit step relationship
63. Sweep rate is controlled by a \_\_\_\_\_  
a) **capacitor**  
b) resistor  
c) diode  
d) inductor
64. Time domain oscilloscopes require \_\_\_\_\_



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- a) **sweep generator**  
b) oscillator
66. What is time base generator?  
a) Time measuring device  
b) generator
67. Linear sweep moves spot \_\_\_\_\_  
a) Top to bottom  
b) right to left
68. Time base generator controls \_\_\_\_\_  
a) Intensity of light  
b) current direction
69. Sweep generator works on the principle of \_\_\_\_\_  
a) Inductor  
b) **Capacitor**
70. Time base generator circuit resembles a \_\_\_\_\_  
a) regulator  
b) rectifier
- c) amplifier  
d) rectifier
- c) **voltage generation device**  
d) current generation device
- c) **left to right**  
d) bottom to top
- c) voltage magnitude  
d) **spot movement**
- c) Resistor  
d) diode
- c) amplifier  
d) **oscillator**





## 5. IC voltage regulators and SMPS

Position in Question Paper

Total Marks-10

Q.2.d) 4-Marks.

Q.4.a) 4-Marks.

Q.5.b) 3-Marks.

Q.6.c) 6-Marks

### Descriptive Question

1. Define stability factor.
2. State application of time base generators
3. Classify time base generators
4. State working principle of miller sweep generator
5. Draw voltage regulated power supply
6. What is load regulation and line regulation
7. State function of 78XX and 79XX
8. Draw pin diagram of IC 723 and name it.
9. Draw low voltage low current using LM317
10. Give classification of SMPS
11. What is sweep period and retrace period?
12. Draw and explain voltage regulated power supply
13. Explain the factors affecting the power supply
14. Draw and explain series voltage regulator
15. Draw and explain miller sweep generator
16. Explain bootstrap time base generator
17. Compare miller sweep and bootstrap circuit
18. Draw functional diagram of three terminal voltage regulator and explain each block
19. Draw positive 12 vlt power supply using IC 7812.
20. Explain negative fixed value 8 vlt supply using IC 7908
21. Draw functional block diagram of IC 723. Describe its working.



22.State 4 features and applications of IC 723.

23.Draw and explain three terminal voltage regulator IC 317

### MCQ Question

(Total number of Question=Marks\*3=10\*3=30)

Note: Correct answer is marked with **bold**

1. What is IC 723?
  - a) **A voltage regulator**
  - b) A full-wave rectifier
  - c) A half-wave rectifier
  - d) A clipper
2. What is line regulation?
  - a) The process of keeping Zener diode voltage constant inspite of changes in AC supply
  - b) **The process of keeping load voltage constant irrespective of the fluctuation in AC supply or the line voltage**
  - c) The process of keeping load voltage constant irrespective of fluctuation in load current
  - d) The process of keeping Zener current constant irrespective of fluctuation in AC supply
3. What is load regulation?
  - a) The process of keeping the load voltage constant irrespective of any change in AC supply
  - b) **The process of keeping the load voltage constant irrespective of variations in load current**
  - c) The process of keeping load voltage constant irrespective of variations in source current
  - d) The process of keeping load current constant irrespective of variations in AC supply
4. 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
5. Which type of regulator is considered more efficient?
  - a) All of the mentioned
  - b) Special regulator
  - c) Fixed output regulator
  - d) **Switching regulator**
6. 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
7. The 7812 regulator IC provides \_\_\_\_\_.
  - a) 5V
  - b) -5V
  - c) **12V**
  - d) -12V
8. Voltage regulators keep a constant \_\_\_\_\_ output voltage when the input or load varies within limits.
  - a) **Dc**
  - b) Ac
  - c) Ripple
  - d) none
9. The 7805 regulator IC provides \_\_\_\_\_.
  - a) **5V**
  - b) -5V
  - c) 12V
  - d) -12V
10. What is the range of the voltage level of the LM317 adjusted voltage regulator?



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- a) 0 V to 5 V  
**b) 1.2 V to 37 V**
- c) -5 V to -24 V  
d) 5 V to 24 V
11. The 7912 regulator IC provides \_\_\_\_\_ .  
a) 5V  
b) -5V  
c) 12V  
**d) -12V**
12. What is the typical dropout voltage for the 7812 fixed positive voltage regulator?  
a) 5V  
b) -5V  
c) **12V**  
d) -12V
13. What is the ratio of the period of the output voltage to the period of the input voltage in a full-wave rectifier?  
a) 0  
**b) 0.5**  
c) 1  
d) 2
14. The \_\_\_\_\_ regulator is less efficient than the \_\_\_\_\_ type, but offers inherent short-circuit protection.  
a) Series, shunt  
**b) Shunt, series**  
c) Series, series  
d) Shunt, shunt
15. \_\_\_\_\_ regulation can be defined as the percentage change in the output voltage for a given change in load current.  
a) **Load**  
b) Line  
c) Both a and b  
d) none
16. How many diodes conduct in the full-wave bridge rectifier while the capacitor is being charged?  
a) **2**  
b) 4  
c) 1  
d) none
17. Voltage regulation requires  
a) only line regulation.  
b) only load regulation.  
c) a constant load.  
**d) load and line regulation**
18. For what range of fixed regulated voltages do the series 78xx regulators provide regulation?  
a) +5 V to +24 V  
**b) +5 V to +24 V**  
c) -5 V to -24 V  
d) None of the above
19. \_\_\_\_\_ regulation can be defined as the percentage change in the output voltage for a given change in the input voltage.  
a) Load  
**b) Line**  
c) Both  
d) none
20. What is full form of SMPS ?  
a) **Switch Mode Power Supply**  
b) Simple Mode Power Supply  
c) Storage Mode Power Supply  
d) Storage Mode Power Shortage
21. 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



**Maratha Vidya Prasarak Samaj's**  
**Rajarshi Shahu Maharaj Polytechnic, Nashik**

Udoji Maratha Boarding Campus, Near Pumping Station, Gangapur Road, Nashik-13.

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22. 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
23. In an unregulated power supply, if load current increases, the output voltage \_\_\_\_\_
- a) Remains the same
  - b) **Decreases**
  - c) Increases
  - d) None of the above
24. In an unregulated power supply, if input a.c. voltage increases, the output voltage \_\_\_\_\_
- a) **Increases**
  - b) Decreases
  - c) Remains the same
  - d) None of the above
25. Power supply which has voltage regulation of \_\_\_\_\_ is unregulated power supply
- a) 0 %
  - b) 5 %
  - c) 10 %
  - d) **8%**
26. An ideal regulated power supply is one which has voltage regulation of \_\_\_\_\_
- a) **0%**
  - b) 5%
  - c) 10%
  - d) 1%
27. A Zener diode utilises \_\_\_\_\_ characteristic for voltage regulation
- a) Forward
  - b) **Reverse**
  - c) Both forward and reverse
  - d) None of the above
28. Zener diode can be used as \_\_\_\_\_
- a) c. voltage regulator only
  - b) c. voltage regulator only
  - c) **both d.c. and a.c. voltage regulator**
  - d) none of the above
29. A Zener diode is used as a \_\_\_\_\_ voltage regulating device
- a) **Shunt**
  - b) Series
  - c) Series-shunt
  - d) None of the above
30. Another name for Zener diode is \_\_\_\_\_ diode
- a) **Breakdown**
  - b) Voltage
  - c) Power
  - d) Current
31. For increasing the voltage rating, zeners are connected in \_\_\_\_\_
- a) Parallel
  - b) Series-parallel
  - c) **Series**
  - d) None of the above
32. In a Zener voltage regulator, the changes in load current produce changes in \_\_\_\_\_
- a) **Zener current**
  - b) Zener voltage
  - c) Zener voltage/Zener current
  - d) None of the above