



**NATIONAL INSTITUTE OF TECHNICAL TEACHERS  
TRAINING AND RESEARCH**  
(DEEMED TO BE UNIVERSITY UNDER DISTINCT CATEGORY)  
**CHANDIGARH**

**Ph.D. Entrance Examination 2024**

Subject / Branch / Department :	<b>ELECTRONICS &amp; COMMUNICATION ENGINEERING</b>
Roll No. :	
Candidate Name :	
Date of Examination :	

**Maximum Marks: 25 (There is no negative marking)**

- Notes:** (a) Only one option to be tick-marked out of the four options given as answer  
 (b) The Candidate must put his/her signature with date at the bottom of each page  
 (c) For any rough work, please use ONLY back-sides of pages which are left blank

- The following stage in a radio receiver provides the maximum image signal selectivity:
  - RF amplifier.
  - IF amplifier
  - Audio amplifier
  - frequency mixer,
- One of the following cannot be used to demodulate SSB
  - Product detector
  - Diode balanced modulator
  - Bipolar transistor balanced modulator
  - Complete phase shift generator
- The channel capacity is exactly equal to
  - Bandwidth of demand
  - Amount of information per second
  - Noise in the channel
  - None of these
- Frequency shift keying is used mostly in:
  - Radio transmission
  - Telegraphy
  - Telephony
  - None of these

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5. The term 'delayed AGC' implies
- (a) Application of AGC after switch of on-off switch
  - (b) Application of AGC to the last stage of receiver,
  - (c) Application of AGC after some time lag
  - (d) Application of AGC only when signal strength has increased beyond a specified value.
6. FM discriminator changes the FM signal into
- (a) AM signal
  - (b) FM signal
  - (c) PM signal
  - (d) None of these
7. (1) An amplitude modulated wave has two sidebands  
(2) Frequency modulated wave has infinite sidebands  
(3) A phase modulated wave has no side bands  
(4) For an AM wave has two side bands, frequency and phase modulated waves have infinite side bands.  
The most correct statement is
- (a) 2, 3
  - (b) 2
  - (c) 4
  - (d) 1, 2, 3, 4
8. One of the advantages of base modulation over collector modulation of a class C amplifier is
- (a) Better efficiency.
  - (b) Low modulating power needed
  - (c) Better linearity,
  - (d) Higher power output per transistor.
9. The commonly employed filter in SSB generation is
- (a) High Pass filter
  - (b) Mechanical filter
  - (c) RC filter
  - (d) LC filter
10. During the day time, ionosphere composes of
- (a) D, E, F2 layer
  - (b) D, F1, F2 layer
  - (c) D, E, F1, F2 layer
  - (d) DE layer



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11. The characteristic impedance of a lossy transmission line depends on
- (a) load importance
  - (b) L and C
  - (c) Length of the line
  - (d) Frequency of the applied voltage
12. Refraction of radio waves in the atmosphere results due to:
- (a) Changes in dielectric constant
  - (b) Changes in density of air
  - (c) Changes in dielectric constant and refractive index.
  - (d) None of these
13. Squelch circuit in radio receiver is used
- (a) To cut off and to amplify between station
  - (b) To catch weak signals
  - (c) To reduce noise
  - (d) To reduce RF interference.
14. Time division multiplex:
- (a) stacks several channels in adjacent frequency slots
  - (b) Interleaves pulses belonging to different transmissions
  - (c) combines 5 groups into a single super group
  - (d) can be used with PCM only
15. Which of the following is used in the IF stage of a receiver?
- (a) Double tuned transformer coupling
  - (b) capacitive coupling,
  - (c) Inductive coupling.
  - (d) None of these
16. The input of the mixer stage is
- (a) Local oscillator signals only
  - (b) RF signals only
  - (c) Small carrier power,
  - (d) Very small carrier power
17. Sampling theorem finds application in
- (a) Amplitude modulation
  - (b) Frequency modulation
  - (c) PCM
  - (d) None of these

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18. An IF amplifier in a Superhetrodyne receiver meets with which of the following requirements of the set?
- (a) Bandwidth
  - (b) Gain
  - (c) Sensitivity
  - (d) All of the above
19. In an intrinsic semiconductor,
- (a) There are no holes in the material
  - (b) The number of holes is too small
  - (c) Electrons in the material are neutralized by holes
  - (d) There are no electrons in the material
20. The base width in a junction transistor is deliberately chosen small so that
- (a) The concentration gradient of injected carriers is small.
  - (b) The electric field is large
  - (c) To reduce recombination of injected minority carriers.
  - (d) The majority carriers easily reach the collector.
21. The forbidden energy gap for germanium is
- (a) 0.3 eV
  - (b) 3.5 eV
  - (c) 0.7 eV
  - (d) 1.12 eV
22. In LED, light is emitted because
- (a) Recombination of charges take place.
  - (b) We make the light fall on light emitting diode.
  - (c) Diode emits light when heated
  - (d) None of these
23. Decibel is defined in terms of
- (a) Voltage ratio
  - (b) Current ratio
  - (c) Power ratio
  - (d) Any of the above
24. OP- AMP used as a tuned amplifier has the tuned circuit connected
- (a) Across input
  - (b) Across series impedance at the input
  - (c) Across feedback impedance  $Z_f$
  - (d) Across output.

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25. BCD numbers are obtained by

- (a) Converting decimal number to binary
- (b) Converting decimal to octal numbers
- (c) Representing each decimal digit by a four bit binary array
- (d) Converting binary to decimal

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