



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

**Ph.D. Entrance Examination 2024**

Subject / Branch / Department :	ELECTRICAL ENGINEERING
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

- At a certain current, the energy stored in iron cored coil is 1000J and its copper loss is 2000W. The time constant (in seconds) of the coil is  
 (A) 0.25  
 (B) ~~(B)~~ 0.5  
 (C)  ~~(C)~~ 1.0  
 (D) ~~(D)~~ 2.0
- A network contains linear resistors and ideal voltage sources. If values of all the resistors are doubled, then the voltage across each resistor is  
 (A) Halved  
 (B) ~~(B)~~ doubled  
 (C) ~~(C)~~ increased by 4 times  
 (D)  ~~(D)~~ not changed
- Two 2-port networks are connected in cascade. The combination is to be represented as a single 2-port network. The parameters of the network are obtained by multiplying the individual  
 (A) z-parameter matrix  
 (B) ~~(B)~~ h-parameter matrix  
 (C) ~~(C)~~ y-parameter matrix  
 (D)  ABCD-parameter matrix

Ph.D. Entrance Exam – 2024, NITTTR Chandigarh

4. Which of the following tests must be performed on a transformer to determine its leakage reactance?
- (A) SC test only
  - (B) OC test only
  - (C) Both OC and SC tests
  - (D) test by an impedance bridge
5. An ideal synchronous motor has no starting torque because the
- (A) rotor is made up of salient poles
  - (B) rotor winding is highly reactive.
  - (C) relative velocity between the stator and rotor mmf is zero.
  - (D) relative velocity between the stator and rotor mmf is not zero
6. If the armature current of dc series motor has become twice then the torque will become
- (A) Twice of the former
  - (B) Four times of the former
  - (C) One fourth of the former
  - (D) Remains same
7. Why is a centrifugal switch used in a single-phase induction motor?
- (A) To protect the motor from overloading
  - (B) To improve the starting performance of the motor.
  - (C) To cut off the starting winding at an appropriate instant.
  - (D) To cut in the capacitor during running conditions.
8. As the temperature is increased, the voltage across a diode carrying a constant current
- (A) increases
  - (B) decreases
  - (C) remains constant
  - (D) may increase or decrease depending upon the doping levels in the junction
9. If differential amplifier has a differential gain of 20000. CMRR= 80dB, then common mode gain is
- (A) 2
  - (B) 1
  - (C)  $\frac{1}{2}$
  - (D) 0

10. Find the function  $f(t)$  for the following function  $F(s)$ :

$$F(s) = \frac{1}{s(s+1)(s+5)}$$

- (A)  $0.25e^{-t} + 0.05e^{-5t}$
  - (B)  $-0.2 - 0.25e^{-t} + 0.05e^{-5t}$
  - (C)  $-0.2 + 0.25e^{-t} + 0.05e^{-5t}$
  - (D)  $0.25e^{-5t} + 0.05e^{-t}$
11. If  $s^3 + Ks^2 + 5s + 10 = 0$ , the root of the feedback system's characteristic equation is said to be critically stable. Then, the value of  $K$  will be:

- (A) 1
- (B) 2
- (C) 3
- (D) 4

12. In an 8085 microprocessor, the number of address lines required to access a 16K byte memory bank is \_\_\_\_\_.

- (A.) 12
- (B) 14
- (C) 8
- (D) 16

13. An alternator has a phase sequence of RYB for its phase voltage. In case the direction of rotation of alternator is reversed, the phase sequence will become

- (A) YRB
- (B) YBR
- (C) RYB
- (D) RBY

14. If the positive, negative, and zero-sequence reactance of an element of a power system is 0.3, 0.3, and 0.8 p.u. respectively, then the element would be a?

- (A) Transmission line
- (B) Synchronous generator
- (C) Synchronous motor
- (D) Static load

Ph.D. Entrance Exam – 2024, NITTTR Chandigarh

15. A 100 km long transmission line is loaded at 110 kV. If the loss of line is 5 MW and the load is 150 MVA, the resistance of the line is
- (A) 8.06 ohms per phase
  - (B) 0.806 ohms per phase
  - (C) 0.0806 ohms per phase
  - (D) 80.6 ohms per phase
16. Which of the following is not a characteristic of an ideal transducer?
- (A) High dynamic range
  - (B) Low linearity
  - (C) High repeatability
  - (D) Low noise
17. Which of the following statements is not necessarily correct for open control system?
- (A) Input command is the sole factor responsible for providing the control action
  - (B) Presence of non-linearities causes malfunctioning
  - (C) Less expensive
  - (D) Generally free from problems of non-linearities
18. If the doping levels of the semiconductor is increased, then the width of the depletion layer
- (A) increases
  - (B) decreases
  - (C) is unchanged
  - (D) keeps oscillating
19. A GTO can be represented by two transistors T1 & T2. The current gain of both transistors are  $\alpha_1$  and  $\alpha_2$  respectively. A low value of gate current requires
- (A) low value of  $\alpha_1$  and  $\alpha_2$
  - (B) low value of  $\alpha_1$  and high value of  $\alpha_2$
  - (C) high value of  $\alpha_1$  and low value of  $\alpha_2$
  - (D) high values of  $\alpha_1$  and  $\alpha_2$

Ph.D. Entrance Exam – 2024, NITTTR Chandigarh

20. A step-down delta-star transformer, with per-phase turns ratio of 5 is fed from a 3-phase 1100 V, 50 Hz source. The secondary of this transformer is connected through a 3-pulse type rectifier, which is feeding feeding an R load. Find the average value of output voltage.
- (A) 220 V  
(B) 257 V  
(C)  $1100/\sqrt{3}$  V  
(D) 206 V
21. Which of the following motors is preferred when quick speed reversal is the main consideration ?
- (A) Squirrel cage induction motor  
(B) Wound rotor induction motor  
(C) Synchronous motor  
(D) D.C. motor
22. Diesel electric traction has comparatively limited overload capacity because
- (A) diesel engine is a constant output prime mover.  
(B) diesel engine has shorter life span.  
(C) regenerative braking cannot be employed.  
(D) diesel-electric locomotive is heavier than an ordinary electric locomotive.
23. A moving coil milliammeter having a resistance of 10 ohms gives full-scale deflection when a current of 5 mA is passed through it. If the instrument is to be used to measure current upto 1 A.
- (A) resistance of  $0.502 \Omega$  must be connected in series with the instrument  
(B) resistance of  $0.502 \Omega$  must be connected in parallel to the load  
(C) resistance of  $0.502 \Omega$  must be connected parallel with the resistance of the ammeter  
(D) resistance  $0.50 \Omega$  must be connected in series with the load
24. A moving coil instrument gives full deflection with 15 mA. The instrument has the resistance of 5 ohms. If a resistance of 0.80 ohms is connected in parallel with the instrument, the instrument will be capable of reading upto
- (A) 150 mA  
(B) 1087 mA  
(C) 750 mA  
(D) 600 mA

Ph.D. Entrance Exam – 2024, NITTTR Chandigarh

25. The braking torque of induction type single-phase energy meter is

- (A) Directly proportional to the square of the flux
- (B) Directly proportional to the flux
- (C) Inversely proportional to the flux
- (D) Inversely proportional to the square of the flux

\*\*\*\*\*

*SS Shami*

Dean - Academics & Students  
NITTTR, Chandigarh - 160019