

TATA STEEL JET EXAMINATION INSTRUMENTATION SAMPLE PAPER (Sample 50 questions)

A. DOMAIN

1. Gunn diodes are used in
(A) high voltage rectification (B) microwave oscillators
(C) Power supply stabilization (D) phase controlled rectifiers
2. Triac is functionally equal to
(A) diode (B) Zener
(C) two paralleled thyristors (D) two inverse parallel connected thyristors
3. Solder is an alloy of
(A) tin and lead (B) nickel and silver
(C) copper and tin (D) tin and nickel
4. Gate delay is highest for which of the following devices ?
(A) C- MOS (B) Schottky (C) TTL (D) DTL
5. The important block of an ALU is
(A) adder (B) CPU (D) Memory (D) Gate
6. Forward resistance of silicon diode is
(A) Zero (B) Low (C) very high (D) infinity
7. Anode supply for a vacuum tube amplifier should be switched on
(A) before switching on filament supply
(B) after switching on filament supply
(C) before plugging in the valves
(D) Does not matter
8. An RLC series circuit tuned for 50 Hz, when supplied from mains at 50 Hz will take
(A) very high current (B) a current equal to V/R ratio
(C) very small current (D) a current equal to V/X_L ratio
9. Capacity of an accumulator is specified in terms of
(A) Ampere hours (B) Watts
(C) Joules (D) Amperes
10. The collector current of a transistor under saturated condition depends on
(A) h_{fe} (B) 1_b
(C) Supply voltage (D) collector resistance
11. The frequency range of a CRO is decided by
(A) bandwidth of vertical amplifier (B) sweep rate
(C) persistence of CRO tube (D) bandwidth of horizontal amplifier

12. Base region in a transistor is made very thin to have
(A) better frequency performance (B) high current gain
(C) Both (A) & (B) (D) better thermal stability
13. Which logic circuit gives highest operating speed ?
(A) Diode logic (B) RTL (C) DTL (D) ECTL
14. A full-wave single-phase rectifier consists of a double-diode vacuum tube, the internal resistance of each element of which may be considered constant and equal to 5000Ω . These feed into a pure resistance load of 2000Ω . The secondary transformer voltage to centre tap is 280 V. Calculate the d.c. output power.
(A) 20.4 W (B) 50.2 W (C) 72.6 W (D) 10.6 W
15. A zener diode has a
(A) high forward-voltage rating
(B) sharp breakdown at low reverse voltage
(C) negative resistance
(D) All of these
16. The Light-Emitting Diode (LED)
(A) is usually made from silicon
(B) uses a reverse-biased junction
(C) gives a light output which increase with the increases in temperature
(D) depends on the recombination of holes and electrons
17. For transistor action the
(A) collector must be more heavily doped than the emitter junction
(B) collector-base junction must be forward biased
(C) base region must be very narrow
(D) base must be more heavily doped than collector and emitter
18. In a half-wave rectifier, the load current flows
(A) for the complete cycle of the input signal
(B) Only for the positive half-cycle of the input signal
(C) less than positive half-cycle of the input signal
(D) more than half cycle, but less than the complete cycle of the input signal
19. In a full wave rectifier, the current in each diode flows for
(A) the complete cycle of the input signal
(B) half-cycle of the input signal
(C) less than half cycle of the input signal
(D) more than half cycle, but less than the complete cycle of the input signal
20. In a centre-tap full-wave rectifier, V_m is the peak voltage between the centre tap and one end of the secondary. The maximum voltage across the reverse-biased diode (i.e. PIV) is
(A) V_m (B) $\frac{1}{2} V_m$ (C) $2 V_m$ (D) $\frac{1}{3} V_m$

21. The potential barrier at a PN- junction is due to the charges on either side of the junction.

These charges are

- (A) minority carriers (B) majority carriers
(C) both majority and minority carriers (D) Fixed donor and acceptor ions

22. In a semiconductor diode, the barrier potential offers opposition to only

- (A) majority carriers in both regions (B) minority carriers in both regions
(C) Free electrons in the N- region (D) holes in the P-region

23. The number of minority carriers crossing the junction of a diode depends primarily on the

- (A) concentration of doping impurities
(B) magnitude of the potential barrier
(C) magnitude of the forward-bias voltage
(D) rate of thermal generation of electron-hole- pairs

24. When a PN- junction is biased in the forward direction

- (A) only holes in P-region are injected into N-region
(B) only electrons in N-region are injected into P-region
(C) majority carriers in each region are injected into the other region
(D) both majority and minority carriers in each region are injected into the other region

25. Inductors work by

- (A) electrostatic induction (B) electromagnetic induction
(C) electrothermal induction (D) None of these

B. GENERAL APTITUDE

26. If 42 persons consume 144 kg of rice in 45 days; then in how many days will 30 persons consume 48 kg of rice?

- (A) 6 days. (B) 7 days. (C) 8 days (D) 12 days:

27. The area of a circle is 24.64 m^2 . The circumference of the circle is:

- (A) 14.64 m (B) 16.36m (C) 17.60.m (D) 18.40 m

28. A certain number of tennis balls were purchased for Rs: 450: Five more balls could have been purchased in the same amount if each ball was cheaper by Rs. 45. The number of balls purchased were:

- (A) 10 (B) 15 (C) 20 (D) 25

29. Which National Highway connects Delhi and Mumbai? -

- (A) NH6 (B).NH 8 (C)NH10 (D) NH 12,

30. A two-digit number is 7 times the sum of its digits. The number formed by reversing its digits is 18 less than the original number. What is the number?

- (A) 42 (B) 52 (C) 62 (D) 72

C. ENGLISH

31. It was _____ hot that day and the cable suffered the brunt of the heat, AW
(A) treacherously (B) acceptably. (C) unfailingly (D) unbelievably -

32. _____ my knowledge, Mr. Akash has a prejudice _____ foreigners.
(A) in..... for (B) as..... towards. (C) for at (D) to..... against

Direction for questions 33-34:

In the following questions, you will find sentences part of which is bold.

Compare the bold part of each sentence with the expressions (A), (B) and (C) given below:
Choose the expression which is an improvement upon the bold part. If none of the three expressions improve the sentence, then your answer is (D).

Questions:

33. It is high time she. **changes** her job.

- (A) must change (C) had changed
(B) changed (D) No improvement

34. I am surprised that **he dares speak** in such a tone to his father.

- (C) he dares to speak (C) he dare to speak
(D) he dare speak (D) No improvement

35. Choose the word which is **nearest in** meaning to the 'bold typed word. He could rise to this stature because of **his invincible** 'courage.

- (A) inviolable (B) unmanageable
(C) unbeatable (D) immeasurable

D. CURRENT INDUSTRY TRENDS

36. What is the full-form of AI in field of technology?

- A. Artificial Information
B. Artificial Intelligence
C. Additional Intelligence
D. Augmented Intelligence

37. TPM concept was first initiated by

- A. Suzuki
B. Nippon Densco
C. TOYOTA
D. Ford Automobiles

38. Full form of TOC is

- A. Theory of Constraints
- B. Tata Overseas Company
- C. Theory of Change
- D. Theory of Commitment

39. The purpose of CPR in Industry Safety is to:

- (A) Maintain oxygenated blood circulation
- (B) Stabilize body temperature to avoid hypothermia
- (C) Build upper body strength
- (D) Dislodge blood clots within the victim's lungs

40. A confined space is deemed ready for employee entry when:

- (A) A company safety inspector has certified it
- (B) The unit operations foreman declares it ready
- (C) An engineer has completed the necessary calculations
- (D) Your supervisor assigns you to the job

E. INDUSTRIAL ORIENTED LEARNING

41. Which of the following is/are the Start-up OBs?

- (A) OB100
- (B) OB101
- (C) OB102
- (D) All of these

42. Default speed of PROFIBUS network is:

- (A) 1.5 Mbps
- (B) 1 Mbps
- (C) 256 Kbps
- (D) 512 Kbps

43. In PLC, Program is executed in

- (A) CPU Module
- (B) I/P Module
- (C) Base Plate
- (D) Power Supply

44. What is the full form of IGBT

- (A) Integrated Gate Bijunction Thyristor
- (B) Internal gate back threshold
- (C) Insulated Gate Bipolar Transistor
- (D) Integrated gate bipolar Transistor

45. Meaning of PWM is

- (A) Pulse wave modulation

- (B) Pulse Width Modulation
- (C) Paper wound media
- (D) Phase width modulation

46. A free wheeling diode:

- (A) prevents negative output (load) voltage
- (B) improves efficiency by transferring stored energy in L to load R
- (C) improves load current waveform, hence better load performance
- (D) All of the above

47. SCRs are used in series to meet

- (A) high current demand.
- (B) low voltage demand.
- (C) low current demand.
- (D) high voltage demand.

48. Which software is used to write a program in Siemens PLC?

- (A) RS logix
- (B) Simatic Manager
- (C) Control Builder
- (D) PL7

49. A thyristor has the following terminals

- (A) Anode, Base , Collector
- (B) Anode, Gate, Cathode
- (C) Emitter, Gate, Cathode
- (D) Anode, Emitter, Collector

50. A reactor is essential in

- (A) circulating current type dual converter
- (B) non-circulating current type dual converter
- (C) Both A & B
- (D) None of these