

**Subject: ELECTRICAL ENGINEERING** ----- **OBJECTIVE ( set-B )**

**Max.Time: 3 HOURS**      **Max. Marks: 300**

ROLL NO.

--	--	--	--	--	--

*For office use only*

**Subject: ELECTRICAL ENGINEERING** ----- **OBJECTIVE**

**Max.Time: 3 HOURS**      **Max. Marks: 300**

*Signature of Invigilator*

*For office use only*

### INSTRUCTIONS FOR CANDIDATES

1. Immediately after the commencement of the Examination, you should check that this Booklet does **NOT** have any unprinted or torn or missing page or items, etc. If any defect is found, get it replaced by Complete Question Booklet.
2. **DO NOT** write your name or anything else except the actual answers to the question, anywhere on the test booklet.
3. Handle your test Booklet carefully in such a manner as it may not be mutilated, folded and torn, etc.
4. This Question Booklet contains **50** questions. Each question contains four responses. Choose **only one correct answer** for each question and put a tick mark (✓) against it.
5. All the questions are compulsory and carry equal marks. Your total score will depend only on the number of correct responses marked by you in the test booklet.
6. No candidate shall be admitted to the Examination Hall 20 minutes after commencement of distribution of the Test Booklet. The Supervisor of the Examination Centre will be the time-keeper and his decision in this regard is final.
7. No candidate shall have in his possession inside the Examination Hall any book, notebook or loose paper, programmable calculator, mobile phone etc. except his admit card and other stationary permitted by Commission.
8. Immediately after the final bell indicating the closure of the examination, stop making any future markings. You should leave the examination hall after your test booklet is collected by the Invigilator.
9. Violation of any of the above Rules will render the candidate liable to be disqualified from the Examination, and according to the nature and gravity of his/her offence, he/she may be debarred from any Examination and interviews conducted by the Commission.

1. In a linear circuit, the superposition principle can be applied to calculate the
  - (a) voltage and power
  - (b) voltage and current
  - (c) current and power
  - (d) voltage, current and power
2. The maximum power that a 12 V dc source with an internal resistance of 2  $\Omega$  can supply to a resistive load is
  - (a) 12W
  - (b) 18W
  - (c) 36W
  - (d) 48W
3. The Thevenin equivalent of a circuit consists of a 10 V voltage source in series with a 5  $\Omega$  resistor. Norton's equivalent of this circuit is a \_\_\_\_\_ current source in parallel with a 5  $\Omega$  resistor.
  - (a) 0.5A
  - (b) 1 A
  - (c) 2 A
  - (d) 4 A
4. A 2-port network is reciprocal if and only if
  - (a)  $Z_{11} = Z_{22}$
  - (b)  $BC-AD = -1$
  - (c)  $Y_{12} = Y_{21}$
  - (d)  $h_{12} = h_{21}$
5. An R-L series circuit is switched on across a dc source of V volt at time  $t=0$ . The current response of the R-L series circuit at any time 't' will be
  - (a)  $i(t) = \frac{V}{R} e^{-\frac{R}{L}t}$
  - (b)  $i(t) = \frac{V}{R}$
  - (c)  $i(t) = \frac{V}{R} (1 - e^{-\frac{R}{L}t})$
  - (d)  $i(t) = -\frac{V}{R} e^{\frac{R}{L}t}$
6. In a two-element series circuit, the applied voltage and resultant current are respectively
 
$$v(t) = 50 + 50 \sin(5 \times 10^3 t) \text{ V}$$

$$i(t) = 11.2 \sin(5 \times 10^3 t + 63^\circ) \text{ A}$$
 The nature of the elements would be
  - (a) R-L
  - (b) R-C
  - (c) L-C
  - (d) none of the above
7. Maxwell's equations are obeyed by an EM wave while it is propagating
  - (a) only in the free space.
  - (b) only in water and free space.
  - (c) only in ionosphere, water and free space.
  - (d) in all the solids, liquids, gases and all the media mentioned above at (a),(b) and (c)
8. By inserting a slab of dielectric material between the plates of a parallel plate capacitor, the energy stored in the capacitor has increased three times. The dielectric constant of the material is
  - (a) 9
  - (b) 3
  - (c) 1/3
  - (d) 1/9
9. The conductance of electrical circuit is analogous in magnetic circuit by
  - (a) flux
  - (b) reluctance
  - (c) permeance
  - (d) capacitance
10. The impedance measured at the input of an infinitely long transmission line is known as
  - (a) input impedance
  - (b) open circuit impedance
  - (c) characteristic impedance
  - (d) short circuit impedance

11. If the load is properly matched with the transmission line, the standing wave ratio will be equal to  
(a) infinity  
(b) 0  
(c) -1  
(d) 1
12. The conductivity of a conductor can be increased by  
(a) decreasing its temperature  
(b) increasing its temperature  
(c) decreasing its vibration  
(d) increasing its vibration
13. The critical temperature above which the ferromagnetic materials lose their magnetic property is known as  
(a) transition temperature  
(b) curie point  
(c) standard temperature  
(d) hysteresis
14. Superconductivity is observed for  
(a) infrared frequencies  
(b) d.c. and low frequency  
(c) a.c. and low frequency  
(d) none of the above
15. Hall voltage is directly proportional to  
(a) current  
(b) electric field  
(c) magnetic flux density  
(d) none of the above
16. Which one of the following bridges is used for the measurement of inductance?  
(a) Wien Bridge  
(b) Schering Bridge  
(c) Maxwell Bridge  
(d) Owen bridge
17. The function of input attenuator in VTVM is to  
(a) increase the input impedance  
(b) attenuate the frequency range  
(c) attenuate the input signal amplitude without altering the frequency contents  
(d) attenuate the input impedance
18. Lissajous pattern obtained on the screen of a CRO can be used to determine  
(a) phase shift  
(b) amplitude distortion  
(c) voltage amplitude  
(d) none of the above
19. Load cell uses  
(a) piezoelectric crystal  
(b) capacitor  
(c) mutual inductance  
(d) strain gauge
20. A Q meter uses the principle of  
(a) variation of self inductance  
(b) variation of mutual inductance  
(c) series resonance  
(d) none of the above
21. Piezoelectric effect can be used to measure  
(a) force  
(b) strain  
(c) acceleration  
(d) all of the above
22. The coding system generally used in digital telemetry is  
(a) pulse position modulation (PPM)  
(b) pulse amplitude modulation (PAM)  
(c) pulse code modulation (PCM)  
(d) pulse duration modulation (PDM)
23. An array elements are always stored in \_\_\_\_\_ memory locations.  
(a) sequential  
(b) random  
(c) sequential and random  
(d) none of the above

24. What is the right way to initialize array?  
(a) `int num[6] = {2,4,12,5,45,5};`  
(b) `int n{} = {2,4,12,5,45,5};`  
(c) `int n{6} = {2,4,12};`  
(d) `int n{6} = {2,4,12,5,45,5};`
25. A program with syntax error  
(a) can be compiled and run  
(b) can be compiled and run, but gives an incorrect result  
(c) cannot be compiled  
(d) none of the above
26. DC shunt motors are used for driving  
(a) machine tools  
(b) lathes  
(c) centrifugal pumps  
(d) all of the above
27. The d.c. motor most suitable for applications requiring high starting torque is  
(a) shunt  
(b) series  
(c) cumulative compound  
(d) differential compound
28. Which of the following connection of the transformer will give the highest secondary voltage?  
(a) Star-star  
(b) Star-delta  
(c) Delta-star  
(d) Delta-delta
29. A 3-phase synchronous motor has  
(a) high starting torque  
(b) no starting torque  
(c) low starting current  
(d) low starting torque
30. The slip of an induction motor normally does not depend on  
(a) rotor speed  
(b) synchronous speed  
(c) shaft torque  
(d) core-loss component
31. In hydroelectric power plants  
(a) operating cost is low and initial cost is high  
(b) operating cost is high and initial cost is low  
(c) both operating and initial cost are high  
(d) both operating and initial cost are low
32. Nuclear reactors usually employ  
(a) fission  
(b) fusion  
(c) both fission and fusion  
(d) none of the above
33. When a fault occurs in a high voltage transmission line, first the  
(a) circuit breaker operates then the relay  
(b) relay operates then the circuit breaker  
(c) isolator operates then the relay  
(d) isolator operates then the circuit breaker
34. Differential relays are used for protection of  
(a) feeders  
(b) alternators  
(c) transformers  
(d) all of the above
35. Lightning arresters are used in power systems to protect electrical equipment against  
(a) direct strokes of lightning  
(b) overvoltages due to indirect lightning stroke  
(c) power frequency overvoltages  
(d) over currents due to lightning

36. The transient stability of synchronous machine connected to an infinite bus-bar system is examined by
- solution of swing equation
  - equal-area criterion
  - either by (a) or by (b)
  - combination of (a) and (b)

37. Corona loss can be reduced by using
- large diameter conductors
  - hollow conductors
  - bundled conductors
  - all of the above

38. Feedback control systems are
- insensitive to both forward and feedback path parameter changes
  - less sensitive to feedback path parameter changes than to forward path parameter changes
  - less sensitive to forward path parameter changes than to feedback path parameter changes
  - equally sensitive to forward and feedback path parameter changes

39. The loop transfer function of a control system is given by

$$G(s)H(s) = \frac{K(s+2)}{s(s^2 + 2s + 3)}$$

The type of the control system is

- zero
  - one
  - two
  - three
40. The transfer function of a system is given as
- $$\frac{100}{s^2 + 20s + 100}$$
- The system is
- an overdamped system
  - an underdamped system
  - a critically damped system
  - an undamped system

41. The frequency at which the magnitude of Bode plot crosses 0 dB axis is known as
- natural frequency
  - phase cross-over frequency
  - gain cross-over frequency
  - corner frequency

42. The Nyquist plot of loop transfer function  $G(s)H(s)$  of a closed loop control system passes through the point  $(-1, j0)$  in the  $G(s)H(s)$  plane. The phase margin of the system is
- $0^\circ$
  - $45^\circ$
  - $90^\circ$
  - $180^\circ$

43. With zero volt on both the inputs, an ideal OP-AMP has output voltage equal to the
- positive supply voltage
  - negative supply voltage
  - zero
  - CMRR

44. For the operation of N-channel E-MOSFET, it is necessary that gate voltage is
- highly negative
  - highly positive
  - low positive
  - zero

45. Negative feedback in an amplifier
- reduces gain
  - increases frequency and phase distortions
  - reduces bandwidth
  - increases noise

46. The decimal equivalent of the hexadecimal number  $(3E8)_{16}$  is
- (a) 982
  - (b) 768
  - (c) 1000
  - (d) 323
47. If A and B are Boolean variables, then  $(A+B).(A+\bar{B})$  equal to
- (a) B
  - (b) A
  - (c) A+B
  - (d) AB
48. A combinational digital circuit
- (a) always contains memory elements
  - (b) never contains memory elements
  - (c) may sometimes contain memory elements
  - (d) contains only memory elements
49. In the process of amplitude modulation (AM)
- (a) the frequency of the carrier signal varies according to the instantaneous value of the signal
  - (b) phase of the carrier signal varies according to the instantaneous value of the signal
  - (c) maximum amplitude of the carrier signal varies according to the instantaneous value of the signal
  - (d) none of the above
50. The technique in which several message signals are combined into a composite signal for transmission over a common channel is known as
- (a) multiplexing
  - (b) demultiplexing
  - (c) modulation
  - (d) demodulation