

Test Booklet
Series

A

Written Test Paper, 2021

Paper No.

11

Test Booklet No.

**FOREMAN
(ELECTRONICS)**

Name of Applicant Answer Sheet No.

Application No. : SVSU/2020/Estt/NT/ Signature of Applicant :

Date of Examination: **25 / 12 / 2021**

Signature of the Invigilator(s)

1.

Time of Examination :

2.

Duration : 60 Minutes]

[Maximum Marks : 50

IMPORTANT INSTRUCTIONS

- (i) The question paper is in the form of Test-Booklet containing **50 (Fifty)** questions. All questions are compulsory. Each question carries four answers marked (A), (B), (C) and (D), out of which only one is correct.
- (ii) On receipt of the Test-Booklet (Question Paper), the candidate should immediately check it and ensure that it contains all the pages, i.e., **50** questions. Discrepancy, if any, should be reported by the candidate to the invigilator immediately after receiving the Test-Booklet.
- (iii) A separate Answer-Sheet is provided with the Test-Booklet/Question Paper. On this sheet there are **50** rows containing four circles each. One row pertains to one question.
- (iv) The candidate should write his/her Application number at the places provided on the cover page of the Test-Booklet/Question Paper and on the Answer-Sheet and NOWHERE ELSE.
- (v) No second Test-Booklet/Question Paper and Answer-Sheet will be given to a candidate. The candidates are advised to be careful in handling it and writing the answer on the Answer-Sheet.
- (vi) For every correct answer of the question **One (1) mark will be awarded**. For every unattempted question, Zero (0) mark shall be awarded. **There is no Negative Marking**.
- (vii) Marking shall be done only on the basis of answers responded on the Answer-Sheet.
- (viii) To mark the answer on the Answer-Sheet, candidate should **darken** the appropriate circle in the row of each question with Blue or Black pen.
- (ix) For each question only **one** circle should be **darkened** as a mark of the answer adopted by the candidate. If more than one circle for the question are found darkened or with one black circle any other circle carries any mark, the question will be treated as cancelled.
- (x) The candidates should not remove any paper from the Test-Booklet/Question Paper. Attempting to remove any paper shall be liable to be punished for use of unfair means.
- (xi) Rough work may be done on the blank space provided in the Test-Booklet/Question Paper only.
- (xii) *Mobile phones (even in Switch-off mode) and such other communication/programmable devices are not allowed inside the examination hall.*
- (xiii) No candidate shall be permitted to leave the examination hall before the expiry of the time.

DO NOT OPEN THIS QUESTION BOOKLET UNTIL ASKED TO DO SO.

[P.T.O.

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1. Which of the following elements comprise of the passive devices?
 - (A) Resistors, Capacitors and SCRs
 - (B) Vacuum Tubes, SCRs and Diodes
 - (C) Transformers, Inductors and Diodes
 - (D) Transformers, TRIACs and DIACs

2. An active device is one which _____
 - (A) Mechanically controls electron flow
 - (B) Electrically controls electron flow
 - (C) Pneumatically controls electron flow
 - (D) Automatically controls electron flow

3. The expression for energy of an inductor _____
 - (A) $\frac{1}{2} LI$
 - (B) $L/2I$
 - (C) $\frac{1}{2} L^2I$
 - (D) $\frac{1}{2} LI^2$

4. If a capacitor of capacitance 9.2 F has a voltage of 22.5 V across it. Calculate the energy of the capacitor.
 - (A) 5062.5 W
 - (B) 506.25 W
 - (C) 50.625 W
 - (D) 50625 W

5. The voltage applied to the 212 mH inductor is given by $v(t) = 15e - 5tv$. Calculate the current
 - (A) $16.782e^{-10t}$
 - (B) $15.75e^{-5t}$
 - (C) $11.27e^{-10t}$
 - (D) $14.15e^{-5t}$

6. What circuit activity may shift a characteristic curve so that diode operating points are different?
 - (A) higher power (heat)
 - (B) higher resistance
 - (C) lower voltage
 - (D) lower current

7. The dc current through each diode in a bridge rectifier equals
 - (A) the load current
 - (B) half the dc load current
 - (C) twice the dc load current
 - (D) one-fourth the dc load current

8. A transistor is a operated device.
 - (A) current
 - (B) voltage
 - (C) both voltage and current
 - (D) None of the above

9. The value of α of a transistor is
 - (A) more than 1
 - (B) less than 1
 - (C) 1
 - (D) None of the above

10. In a transistor, $I_C = 100$ mA and $I_E = 100.2$ mA. The value of β is
 - (A) 100
 - (B) 50
 - (C) about 1
 - (D) 200

11. The fundamental period of the signal $X(t) = 10 \cos 2(10 \pi t)$ is _____
- (A) 0.2
(B) 0.1
(C) 0.5
(D) No fundamental period exists
12. The even component of the signal $X(t) = e^{jt}$ is _____
- (A) $\sin t$
(B) $\cos t$
(C) $\sinh t$
(D) $\cosh t$
13. How can we generate a periodic signal from a periodic signal itself?
- (A) By extending a signal with duration T
(B) Cannot be extended
(C) By extending the periodic signal's amplitude
(D) By extending the signal with duration 2π
14. A dependent source _____
- (A) may be a current source or a voltage source
(B) is always a voltage source
(C) is always a current source
(D) None of the mentioned
15. A constant current source supplies a electric current of 200 mA to a load of 2 k Ω . When the load changed to 100 Ω , the load current will be _____
- (A) 9 mA
(B) 4 A
(C) 700 mA
(D) 12 A
16. Which of the following electrical characteristics is not exhibited by an ideal op-amp?
- (A) Infinite voltage gain
(B) Infinite bandwidth
(C) Infinite output resistance
(D) Infinite slew rate
17. Ideal op-amp has infinite voltage gain because
- (A) To control the output voltage
(B) To obtain finite output voltage
(C) To receive zero noise output voltage
(D) None of the mentioned
18. Find the input voltage of an ideal op-amp. It's one of the inputs and output voltages are 2v and 12v. (Gain = 3)
- (A) 8v
(B) 4v
(C) - 4v
(D) - 2v
19. The output voltage of an open-loop differential amplifier is equal to
- (A) Double the difference between the two input voltages
(B) Product of voltage gain and individual input voltages
(C) Product of voltage gain and the difference between the two input voltages
(D) Double the voltage gain and the difference between two input voltages

20. Why open-loop op-amp configurations are not used in linear applications?
- Output reaches positive saturation
 - Output reaches negative saturation
 - Output switches between positive and negative saturation
 - Output reaches both positive and negative saturation
21. On what criteria does the feedback amplifier are classified?
- Signal fed back to input
 - Signal applied to input
 - Signal fed back to output
 - None of the mentioned
22. In op-amp differentiator the capacitor is
- Feedback element
 - Input element
 - Both of these
 - None of these
23. In boolean algebra, the OR operation is performed by which properties?
- Associative properties
 - Commutative properties
 - Distributive properties
 - All of the Mentioned
24. The boolean function $A + BC$ is a reduced form of _____
- $AB + BC$
 - $(A + B)(A + C)$
 - $A'B + AB'C$
 - $(A + C)$
25. The AND operation is equivalent to
- Union
 - Intersection
 - Division
 - Both option (A) and (B)
26. Which logic unit is the fastest of all the logic families?
- DTL
 - TTL
 - ECL
 - CMOS
27. The primary difference between a counter and a register is
- A counter has the capability to store n bit of information whereas a register has one bit
 - A register counts data
 - A register has no specific sequence of states
 - A counter has no particular sequence of states.
28. At which frequency the digital data can be applied to a gate?
- Run-time frequency
 - Propagation Frequency
 - Operating frequency
 - AC frequency
29. In an 8-bit Johnson counter sequence, how many states orbit patterns are possible?
- 240
 - 228
 - 232
 - 220
30. Calculate the emf when the flux is given by $3 \sin t + 5 \cos t$
- $3 \cos t - 5 \sin t$
 - $-3 \cos t + 5 \sin t$
 - $-3 \sin t - 5 \cos t$
 - $3 \cos t + 5 \sin t$

31. Calculate the emf when a coil of 100 turns is subjected to a flux rate of 0.3 tesla/sec.
- (A) 3
(B) 30
(C) -30
(D) -300
32. In order to minimise hysteresis loss, the magnetic material should have
- (A) High resistivity
(B) Low hysteresis co-efficient
(C) Large B - H loop area
(D) High retentivity
33. According to Steinmetz hysteresis law, hysteresis loss in a material is proportional to
- (A) B 3.6
(B) B 1.6
(C) B 1.2
(D) B 2.6
34. How to increase the energy stored in an inductor by four times?
- (A) By doubling the current
(B) This is not possible
(C) By doubling the inductance
(D) By making current $\sqrt{2}$ time
35. Which part of the magnetic path requires largest MMF?
- (A) Core
(B) Air gap
(C) Coil
(D) Inductance
36. The four bulbs of 40 watts each are connected in series with a battery across them, which of the following statements is true?
- (A) The voltage across each bulb is same
(B) The power dissipation in each bulb is not same
(C) The current through each bulb is same
(D) None of the above
37. Time period of 60 Hz Waveform is
- (A) 16.66 ms
(B) 20 ms
(C) 35 ms
(D) 60 s
38. For addition and subtraction of phasors, we use the _____ form.
- (A) Rectangular
(B) Polar
(C) Either rectangular or polar
(D) Neither rectangular nor polar
39. The rms value is _____ times the maximum value.
- (A) 1.414
(B) 0.5
(C) 2
(D) 0.707
40. Find the value of the instantaneous voltage if the resistance is 2 ohm and the instantaneous current in the circuit is 5 A.
- (A) 5 V
(B) 2 V
(C) 10 V
(D) 2.5 V

41. The current in the capacitor leads the voltage in a series RLC circuit _____ resonant frequency.
 (A) Above
 (B) Below
 (C) Equal to
 (D) Depends on the circuit
42. If a transformer is fed from a 220 V and dc supply rather than a 1-phase ac supply, then the transformer will
 (A) burn its windings
 (B) operate normal
 (C) will not operate
 (D) will give very small leakage flux
43. The shell type transformers have, LV and HV windings are arranged such that
 (A) Half LV near the core and half HV outside LV on each limb
 (B) LV on one limb and HV on the other
 (C) Half LV outside the core and half HV inside LV on each limb
 (D) LV and HV windings are sandwiched
44. The critical resistance refers to
 (A) the resistance above which machine does not excite
 (B) the resistance below which machine does not excite
 (C) the resistance at which machine does not excite
 (D) Any of the mentioned
45. Hoists, cranes and battery powered vehicles use _____ motors in the locomotive.
 (A) dc series
 (B) dc shunt
 (C) induction
 (D) reluctance
46. If the field current and armature current are reversed, then
 (A) direction of rotation remains same
 (B) direction of rotation reverses
 (C) stops
 (D) None of the mentioned
47. If an unbalanced supply is fed to an induction motor, it will cause excessive heating of
 (A) rotor
 (B) stator
 (C) rotor shaft
 (D) All of the mentioned
48. Which of the following is the main advantage of an auto-transformer over a two-winding transformer?
 (A) Hysteresis losses are reduced
 (B) Saving in winding material
 (C) Copper losses are negligible
 (D) Eddy losses are totally eliminated
49. What are the modes in which power can be transferred in an autotransformer?
 (A) Conduction
 (B) Induction
 (C) Conduction and Induction
 (D) Cannot be said
50. The voltage applied across an R-L circuit is equal to of VR and VL
 (A) Phasor sum
 (B) Arithmetic sum
 (C) Sum of the squares
 (D) Algebraic sum

ROUGH WORK

ANSWERS KEY Foreman Electronics

1. C	26. C
2. B	27. C
3. D	28. C
4. *****	29. A
5. D	30. B
6. A	31. C
7. A	32. B
8. A	33. B
9. B	34. A
10. *****	35. B
11. B	36. C
12. B	37. A
13. A	38. A
14. A	39. D
15. B	40. C
16. C	41. B
17. B	42. A
18. D	43. D
19. C	44. A
20. C	45. A
21. D	46. A
22. B	47. A
23. D	48. B
24. B	49. C
25. B	50. A

Note:- Question No. 4 and 10 are moved out.