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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (S, FE) / S6 (PT) (S) Examination January 2024 (2019 Scheme)

Course Code: EET 308

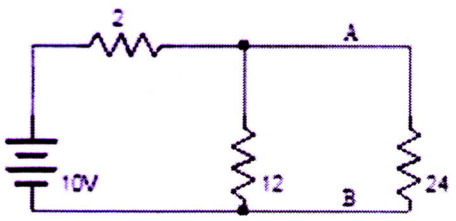
Course name: COMPREHENSIVE COURSE WORK

Max. Marks: 50 Duration: 1Hour

Instructions: ***(1) Each question carries one mark. No negative marks for wrong answers***
(2) Total number of questions: 50
(3) All questions are to be answered. Each question will be followed by 4 possible answers of which only ONE is correct.
(4) If more than one option is chosen, it will not be considered for valuation.

1. Superposition theorem cannot be applied in linear circuits to find out the following variable
   a) Voltage b) Current c) Power d) None of these

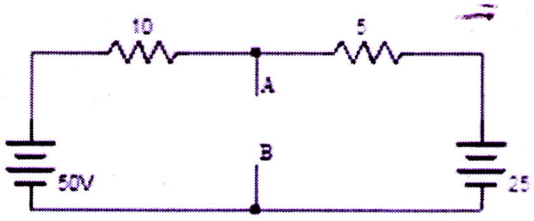
2. Consider the circuit shown below. Find the Thevenin's resistance between terminals A and B. (All the value of resistances are in Ω).



   a) 1 Ω b) 2 Ω c) 1.7 Ω d) 2.7 Ω

3. An ac source of V=50V and f=50 Hz, having an internal impedance of (1+j2) Ω is connected across a load. For maximum power transfer, the load impedance should be
   a) (1+j2) Ω b) (1-j2) Ω c) (2 +j4) Ω d) j2 Ω

4. Determine the equivalent Thevenin's voltage between terminals A and B in the circuit shown below. (All the value of resistances are in Ω).

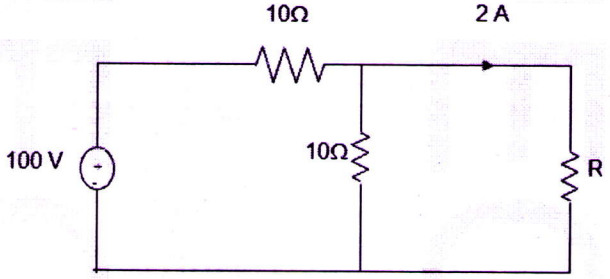


   a) 0.333 V b) 3.33 V c) 33.3 V d) 333 V

5. The circuit which satisfies Reciprocity Theorem is called

a) Short circuit b) Open circuit c) Linear circuit d) Non-linear circuit

6. In the figure given below, the value of Resistance R is



a) 10 b) 20 c) 30 d) 40

7. A circuit with a resistor, inductor and capacitor in series is resonant at f_0 Hz.If all the component values are now doubled ,the new resonant frequency is

a) $2f_0$ b) f_0 c) $f_0/4$ d) $f_0/2$

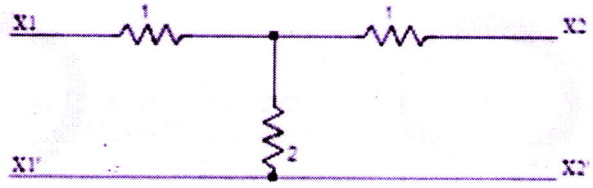
8. The relation between V_{RY}, V_{ph} in a star connected system is

a) $V_{RY} = V_{ph}$ b) $V_{RY} = \sqrt{3}\ V_{ph}$ c) $V_{RY} = 3\sqrt{3}\ V_{ph}$ d) $V_{RY} = 3\ V_{ph}$

9. The hybrid parameter h_{21} is called

a) open circuit output admittance b) open circuit reverse voltage gain c) short circuit forward current gain d) short circuit input impedance

10. In the circuit shown below, find the Z-parameter Z11



a) 1 b) 2 c) 3 d) 4

11 A 4-point starter is used to start and control the speed of a

a) DC shunt motor with armature resistance control b) DC shunt motor with field weakening control. c) DC series motor d) DC compound motor

12 Select a suitable winding for DC generator for generating large current

a) Progressive wave winding b) Lap winding c) Retrogressive wave winding d) Wave winding

13 In a DC machine, which of the following statements is true?

a) compensating winding is used for neutralizing armature reaction while interpole is used for producing residual flux

b) compensating winding is used for neutralizing armature reaction while interpole is used for improving commutation

c) compensating winding is used for improving commutation while interpole is used for neutralizing armature reaction

d) compensating winding is used for improving commutation reaction while interpole is used for producing residual flux

14 A DC motor, which can provide zero speed regulation at full load without any controller is

a) Series b) Shunt c) Cumulative compound d) Differential compound

15 DC shunt motors are commonly used in

a) Cranes b) Electric traction c) Elevators d) Lathe machines

16 In a transformer, zero voltage regulation at full load is

a) Not possible b) possible at unity power factor load c) possible at leading power factor load d) possible at lagging power factor load

17 Two transformers of identical voltage but of different capacities are operating in parallel. For satisfactory load sharing

a) Impedance must be equal b) Per unit impedance must be equal c) Per unit impedance and X/R ratios must be equal d) Impedances and X/R ratios must be equal

18 The function of oil in a transformer is

a) To provide insulation and cooling b) To provide protection against lightning c) To provide protection against short circuit d) To provide lubrication

19 A series-wound motor is also called as universal motor because

a) It will run equally well using either an ac or a dc voltage source b) It will run well below and above rated speed c) It can be used in all kinds of applications d) None of these

20 The power factor in a transformer

a) is always unity b) is always leading c) is always lagging d) depends on the power factor of load

21 The following hexadecimal number $(1E.43)_{16}$ is equivalent to

a) $(36.506)_8$ b) $(36.206)_8$ c) $(35.506)_8$ d) $(36.206)_8$

22 The Boolean expression AB+AC'+BC simplifies to

a) BC+AC' b) AB+AC c) AB+AC'+B d) AB +BC

23 A combinational logic circuit, which generates a particular binary word or number is

a) Encoder b) Multiplexer c) Decoder d) Demultiplexer

24 f(A,B,C,D)=πm (0,1,3,4,5,7,9,11,12,13,14,15) is a maxterm representation of a Boolean function f(A,B,C,D) where A is the MSB and D is the LSB. The equivalent minimized representation of this function is

a) (A + C' + D)(A' + B + D) b) AC'D + A'BD c) A'CD' + AB'CD' + AB'C'D' d) A'CD' + AB'CD' + AB'C'D'

25 The race around condition occurs in a JK flip flop when

a) Both inputs are 0 b) Both inputs are 1 c) The inputs are complementary d) any one of the inputs

26 A shift register can be used for

a) parallel to serial conversion only b) serial to parallel conversion only c) Digital time delay only d) all of the above

27 Which number system has a base 16

a) Hexadecimal b) Octal c) binary d) decimal

28 Convert $(312)_8$ into decimal

a) 201 b) 202 c) 203 d) 204

29 What is the addition of the binary number 101001+ 010011=?

a) 010100 b) 111100 c) 000111 d) 101110

30 The complete set of only those Logic Gates designated as Universal gates is

a) NOT,OR and AND gate b) XNOR,NOR and NAND gate c) NOR and NAND gate d) XOR,NOR and NAND gate

31 Pin insulators are normally used up to voltage of about

a) 100 kV b) 33 Kv c) 66 kV d) 250 kV

32 A synchronous condenser is virtually which of the following?

a) Induction motor b) Under excited synchronous motor c) Over excited synchronous motor d) D.C. generator

33 Which material is used in controlling chain reaction in a nuclear reactor?

a) Thorium b) Heavy water c) Beryllium d) Boron

34 Ferranti effect states that under certain conditions the sending end voltage is

a) Less that receiving end voltage b) Greater than receiving end voltage c) Equal to receiving end voltage d) Abnormally high

35 The diversity factor is defined as the

a) Average demand/ maximum demand b) Sum of consumers maximum demand/ Maximum load on the station c) Maximum demand/ Average demand d) Average demand/Capacity factor

36 Which of the following generating station has the minimum running cost?

a) Hydro-electric station b) Nuclear power station c) Thermal power station d) Diesel power plant

37 Corona is accompanied by

a) Violet visible discharge in darkness b) Hissing sound c) Ozone d) All of the above

38 What is the cause of skin effect?

a) Supply frequency b) Self-inductance of conductor c) High sensitive material in the centre d) Both (a) and (b)

39 In which of the transmission systems is the skin effect observed?

a) Cable carrying dc current b) DC transmission line only c) AC transmission line only d) DC as well as AC transmission lines

40 On what factor does the string efficiency of a string of suspension insulators dependent?

a) Size of the insulator b) Number of discs in the string c) Size of tower d) None of these

41 Energy of a power signal is

a) Finite b) Zero c) Infinite d) Between 1 And 2

42 A time invariant system is a system whose output

a) increases with a delay in input b) decreases with a delay in input c) remains same with a delay in input d) vanishes with a delay in input

43 If x (-t) = -x (t) then the signal is said to be _____

a) Even signal b) Odd signal c) Periodic signal d) Non periodic signal

44 What is the area of a Unit Impulse function?

a) Zero b) Half of Unity c) Depends on the function d) Unity

45 In a signal flow graph, nodes are represented by small _____

a) Circles b) Squares c) Arrows d) Pointer

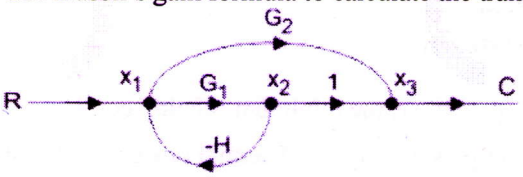
46 If a pole is located at s = -5 in left-hand plane (LHP), how will it be represented in Laplace domain?

a) $1/s+5$ b) $1/s-5$ c) $s/s+5$ d) $s/s-5$

47 If X(z) is the z-transform of the signal x(n) then what is the z-transform of anx(n)?

a) X(az) b) $X(a\,z^{-1})$ c) $X(a^{-1}z)$ d) None of these

48 Use mason's gain formula to calculate the transfer function of given figure:



a) $G_1/1+G_2H$ b) $G_1+G_2/1+G_1H$ c) $G_2/1+G_1H$ d) None of these

49 The Z transform of δ (n − m) is _____

a) z^{-n} b) z^{-m} c) 1/(z-n) d) 1/(z-m)

50 What is the z-transform of the following finite duration signal?
x(n)={2,4,5,7,0,1}?
↑

a) $2+4z+5z^2+7z^3+z^4$ b) $2+4z+5z^2+7z^3+z^5$ c) $2+4z^{-1}+5z^{-2}+7z^{-3}+z^{-5}$ d) $2z^2+4z+5+7z^{-1}+z^{-3}$