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Reg No.:_____ Name:_____

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Sixth Semester B.Tech Degree Supplementary Examination May 2023 (2019 Scheme)

**Course Code: EET308**

**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. What is the transfer impedance of a two port network?

a) The ratio of input voltage to output current
b) The ratio of output voltage to input current
c) The ratio of input impedance to output impedance
d) The ratio of output impedance to input impedance

2. For a two-port network, Z11 = 20 Ω, Z12 = 30 Ω, Z21 = 15 Ω, and Z22 = 25 Ω. What are the input impedance and output impedance?

a) Zin = 2 Ω and Zout = 10 Ω
b) Zin = 10 Ω and Zout = 2 Ω
c) Zin = 5 Ω and Zout = 15 Ω
d) Zin = 15 Ω and Zout = 5 Ω

3. For a two-port network, Zin = 50 Ω, Zout = 100 Ω, Av = 5, and Ai = 0.5. Find the Z-parameter matrix

a) [ -25 -250 ] [ ] [-62.5 125 ]
b) [ 25 -250 ] [ ] [-62.5 -125 ]
c) [ 25 250 ] [ ] [62.5 -125 ]
d) [ -25 250 ] [ ] [62.5 125 ]

4. What is the relationship between Z-parameters and impedance in a two-port network?

a) Z11 = input impedance, Z22 = output impedance
b) Z11 = output impedance, Z22 = input impedance
c) Z12 = input impedance, Z21 = output impedance
d) Z12 = output impedance, Z21 = input impedance

5. What is the equivalent circuit representation of a two-port network using T-parameters?

a) T = [A B; C D]
b) T = [A -B; C -D]
c) T = [D -B; -C A]
d) T = [D B; -C A]

6. A network is said to be symmetrical if:

a) Z11 = Z22
b) Y11 = Y22
c) H11 = H22
d) All of the above

7. The transfer function of a system has two poles at s = -2 and s = -5. What is the order of the system?

a) First order b) Second order c) Third order d) Fourth order

8. Which of the following statements is true about the pole of a transfer function?

a) It is the value of s for which the denominator of the transfer function becomes zero

b) It is the value of s for which the numerator of the transfer function becomes zero

c) It is the value of s for which the transfer function becomes infinite

d) It is the value of s for which the transfer function becomes zero

9. What is the name of the parameter that is used to describe a series-connected network?

a) Impedance b) Admittance c) Transmission d) Hybrid

10. How do you obtain the equivalent transmission parameter of a cascade-connected network?

a) By adding their individual transmission parameters

b) By subtracting their individual transmission parameters

c) By multiplying their individual transmission parameters

d) By dividing their individual transmission parameters

11 The binary number 10101 is equivalent to decimal number

a) 19 b) 12 c) 27 d) 21

12 The inputs of a NAND gate are connected together. The resulting circuit is

a) OR gate b) AND gate c) NOT gate d) None of the above

13 The NAND gate is AND gate followed by

a) NOT gate b) OR gate c) AND gate d) None of the above

14 In Boolean algebra, the bar sign (-) indicates

a) OR operation b) AND operation c) NOT operation d) None of the above

15 The resolution of an n bit DAC with a maximum input of 5 V is 5 mV. The value of n is

a) 8 b) 9 c) 10 d) 11

16 An OR gate has 4 inputs. One input is high and the other three are low. The output is

a) Low b) High c) Alternately high and low d) may be high or low depending on relative magnitude of inputs

17 In 2's complement representation the number 11100101 represents the decimal number

a) +37 b) -31 c) +27 d) -27

18 The number of digits in octal system is

a) 8 b) 7 c) 9 d) 10

19 An AND gate has two inputs A and B and one inhibit input 3, Output is 1 if

a) A = 1, B = 1, S = 1 b) A = 1, B = 1, S = 0 c) A = 1, B = 0, S = 1 d) A = 1, B = 0, S = 0

20 1's complement of 11100110 is

a) 00011001 b) 10000001 c) 00011010 d) 00000000

21 Which losses can be identified from Swinburne's test?

a) No-load core loss b) Windage and friction loss c) No-load and windage and friction loss d) Stray load loss

22 A starter is required for a 220-V shunt motor. The maximum allowable current is 55 A and the minimum current is about 35 A. The armature resistance of the motor is 0.4 Ω. What will be the number of sections of starter resistance required?

a) 5 b) 4 c) 6 d) 8

23 The speed of a motor falls from 1200 rpm at no-load to 1050 rpm at rated load. The speed regulation of the motor is

a) 12.36% b) 14.28% c) 16.77% d) 18.84%

24 The efficiency of the DC motor at maximum power will be

a) 100% b) Around 90% c) Anywhere between 75% and 90% d) Less than 50%

25 Armature reaction AT in a dc machine

a) are in the same direction as the main poles b) are in direct opposition to the main poles c) make an angle of 90° with the main pole axis d) make an angle with the main pole axis which is load dependent

26 A differentially compounded motor under high- over-load conditions will behave like a/an

a) Shunt motor b) Series motor c) Cumulatively compound motor d) Synchronous motor

27 6-pole lap-wound dc armature with 720 conductors draws 50 A from the mains. Its armature reaction per pole is

a) 1000 AT peak, triangular in wave shape b) 500 AT peak, sinusoidal in wave shape c) 1000 AT peak, sinusoidal in wave shape d) 500 AT peak, triangular in wave shape

28 Neglecting all losses, the developed torque (T) of a dc separately excited motor, operating under constant terminal voltage, is related to its output power (P) as

a) Tx vP b) T2 x P3 c) Tx P d) T is independent of P

29 A 200 V, 2000 rpm, 10A, separately excited de motor has an armature resistance of 2002. Rated de voltage is applied to both the armature and field winding of the motor. If the armature draws 5 A from the source, the torque developed by the motor is

a) 4.30 Nm b) 4.77 Nm c) 0.45 Nm d) 0.50 Nm

30 An electric motor with "constant output power" will have a torque-speed characteristic in the form of a

a) straight line through the origin b) straight line parallel to the speed axis c) circle about the origin d) rectangular hyperbola

31 If the length of the cross arm is increased, the string efficiency

a) becomes zero b) increases c) remains unaffected d) decreases

32 The minimum phase-neutral voltage at which corona starts to occur in power transmission lines is called

a) Knee voltage b) Visual critical voltage c) Critical disruptive voltage d) Flash voltage

33 The corona effect can be minimized by increasing

a) The length of conduct b) Spacing between conductors c) Diameter of conductors d) Both spacing between conductors and diameter of the conductors

34 What will be the maximum sag if working tension is 4000 kg, resultant force per meter length of conductor is 2 and span length is 320 meter?

a) 10.2 b) 6.4 c) 3.2 d) 9.6

35 In the design of a distributor which of the following is the major consideration?

a) Voltage drop b) Current carrying capacity c) Frequency d) KVA system

36 Which of the following characteristics should the line supports for transmission line possess?

a) Low-cost b) High mechanical strength c) Longer life d) All of the above

37 The feeder is designed mainly from the point of view of

a) Its current carrying capacity b) Voltage drop in it c) Operating voltage d) Operating frequency

38 Identify the correct statement for EHVAC transmission on comparison to HVDC transmission system?

a) There is greater power per conductor and simpler line construction b) Pollution affects less and less frequency clearing of insulators is required c) A smaller amount of right of way and narrower tower are required d) Corona loss, radio interference and audible emissions are less

39 If the effect of earth is taken into account, then the capacitance of line to ground:

a) Remains unchanged b) decreases c) Increases d) Becomes infinite

40 The distribution feeding system of ring main system has

a) 4 feeders b) 2 feeders c) 1 feeder d) Can't be predicted

41 Construct the inverse system of $y(t) = 2x(t)$

a) $y(t) = 0.5x(t)$ b) $y(t) = 2x(t)$ c) $y(2t) = x(t)$ d) $y(t) = x(2t)$

42 y[n] = x[-n]. The system is

a) Time invariant b) Causal c) Non causal d) Time varying

43 A system is said to be shift invariant only if

a) a shift in the input signal also results in the corresponding shift in the output

b) a shift in the input signal does not exhibit the corresponding shift in the output

c) a shifting level does not vary in an input as well as output

d) a shifting at input does not affect the output

44 Under which conditions does an initially relaxed system become unstable ?

a) only if bounded input generates unbounded output

b) only if bounded input generates bounded output

c) only if unbounded input generates unbounded output

d) only if unbounded input generates bounded output

45 $$H(z) = \frac{z(3z-4)}{(z-0.4)(z-2)}$$

What about the stability of system

a) system is stable b) unstable c) stable at 0.4 d) Can't be predicted

46 When is the system said to be causal as well as stable in accordance to pole/zero of ROC specified by system transfer function?

a) Only if all the poles of system transfer function lie in left-half of S-plane

b) Only if all the poles of system transfer function lie in right-half of S-plane

c) Only if all the poles of system transfer function lie at the centre of S-plane

d) None of the above

47 y[t]= ∫x[t],t ranges from 0 to t. Is the system a memoryless one?

a) Yes b) No c) Both memoryless and having memory d) None of the above

48 Comment on the linearity of y[n] = n*x[n].

a) Linear b) Only additive c) Not scalable d) Non-linear

49 Find the value of h[n]*d[n-1], d[n] being the delta function

a) h[n-2] b) h[n] c) h[n-1] d) h[n+1]

50 Which of the following is correct regarding to impulse signal?

a) x[n]δ[n] = x[0]δ[n] b) x[n]δ[n] = δ[n] c) x[n]δ[n] = x[n] d) x[n]δ[n] = x[0]

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