F 0600EET308052201 Pages: 5

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Sixth Semester B.Tech Degree Examination June 2022 (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. A coil of resistance 5Ω and inductance of 7 H is switched to a 230V supply. The steady state value of current in the circuit is

   a) 46 A b) 23A c) 32.85A d) 12A

2. A dc series motor should always be started with load because

   a) At no load, it will rotate at dangerously high speed b) It will fail to start c) It will not develop high starting torque d) All are true

3. Binary equivalent of $(45.312)_8$ is

   a) $(100101.011001010)_2$ b) $(000100.011001111)_2$ c) $(1000111.01111010)_2$ d) $(100101.011110010)_2$

4. A power system will have greater flexibility of operation if they have _____

   a) Only Base load plants operating in combination b) Various types of power plants operating in combination c) Only Peak load plants operating in combination d) Only thermal power plants operating in combination

5. Compute the energy and power of signal $x(t)= 4\sin(2\pi t)$, $-\infty < t < \infty$

   a) 0 , 8 b) ∞ , 0 c) ∞ , 8 d) 2 , ∞

6. Thevenin's Impedance can be found out by

   a) Short circuiting all independent current sources and open circuiting all independent voltage sources b) Short circuiting all independent voltage sources and open circuiting all independent current sources c) Short circuiting all independent voltage sources and current sources d) Open circuiting all independent voltage sources and current sources

7. In a transformer the voltage regulation will be zero when it operates at

   a) Unity power factor b) Leading power factor c) Lagging power factor d) Zero power factor

8. An hexa decimal to binary conversion can be accomplished by simply replacing each hexa decimal symbol by its _____ binary equivalent.

a) 2-bit b) 3-bit c) 4-bit d) 5-bit

9. A protection system engineer is planning to provide the complete protection, he can achieve this by _____

a) a two phase fault relays and three earth fault relays
b) a two phase fault relays and two earth fault relays
c) two phase fault relays and three earth fault relays
d) three phase fault relays and two earth fault relays

10. Which of the following represent Signum function "sgn (t)" for $t > 0$, $t = 0$, $t < 0$

a) 1,0,1 b) -1,1,1 c) 1,0, -1 d) 0,1,1

11 An electrical network has a graph of 7 branches and 4 nodes. The number of links is

a) 5 b) 4 c) 3 d) 2

12 The emf induced in the primary of a transformer

a) Is in phase with the flux
b) Lags behind the flux by 90 degree.
c) Leads the flux by 90 degree
d) Is in phase opposition to that of flux

13 Decimal equivalent of the single-precision floating point number (11000000101000…00) is

a) -5.05 b) -5.02 c) -5.0 d) -5.1

14 The area under the load curve represents _____

a) maximum demand
b) load factor
c) the average load on power system
d) number of units generated

15 Which of the following statements is true about the given three continuous time systems
(A) $y(t) = x(-t)$, (B) $y(t) = x(4t)$, (C) $y(t) = d\,x(t)/\,dt$

a) All are time invariant
b) A is time varying B is time varying C is time-invariant
c) A is time invariant B is time invariant C is time varying
d) A is time varying B is time invariant C is time varying

16 The mutual inductance between two ideally coupled coils of 4H each is

a) 16 H b) 2 H c) 4 H d) 8 H

17 The drive motor used in a mixer-grinder is a

a) DC motor b) Induction motor c) Synchronous motor d) Universal motor

18 The Boolean function $F(A, B, C) = \Sigma(3, 4,6,7)$ is equivalent to

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

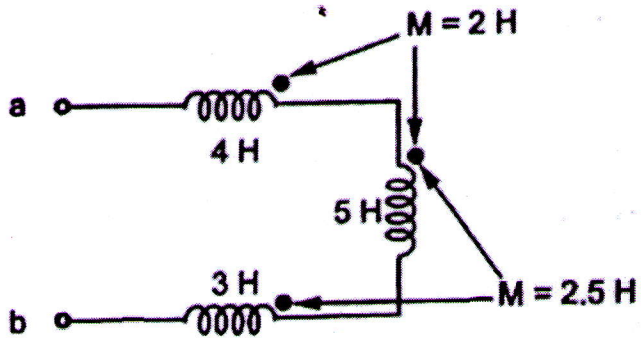
19 If all the sequence voltages at the fault point in a power system are equal, then fault is _____

a) LLG fault b) Line to Line fault c) Three phase to ground fault d) LG fault

20 The system is causal when the current output sample depends on

a) current input sample
b) current or next and past input samples
c) current and/or past input samples and/or past output samples
d) next or past input samples or past output sample

21 The effective inductance of given circuit is



a) 10 H b) 11 H c) 12 H d) 13 H

22 A commutator in a DC machine

a) Reduces power loss in armature b) Reduces power loss in field circuit c) Converts the induced AC armature voltage into DC voltage d) Is not necessary

23 The maximum noise voltage that may appear at the input of a logic gate without changing the logical state of its output is termed as

a) Noise Margin b) Noise Immunity c) White Noise d) Signal to Noise Ratio

24 Voltage regulation in the power system is _____

a) dip in voltage at sending end b) rise in voltage at sending end c) rise in voltage at receiving end d) dip in voltage at receiving end

25 Convolution of 2 DT sequences of lengths P and Q results in convolved sequence of length

a) P + Q b) P + Q + 1 c) P + Q – 1 d) P – Q

26 A DC voltage of 100V is applied to a coil having resistance 10Ω and inductance 10H. What is the value of current 0.1 sec later after switching on the supply

a) 10 A b) 0.5 A c) 5A d) 0.9516A

27 When two transformers are operating in parallel, they will share the load as under

a) Proportional to their impedances b) Inversely proportional to their impedances c) 50%-50% d) 25%-75%

28 The equivalent Gray Code of the binary number $(1011)_2$ is

a) (1101) b) (1011) c) (1110) d) (1100)

29 Which of the following is not neglected during formation of reactance diagram from impedance diagram?

a) Shunt component of Transformers b) Static loads c) Resistance of various power system components d) Reactance of alternators

30 Fourier series coefficients for the signal $x(t) = 5 \cos (\pi t/ t)$ are

a) X[k] = 5 / 2 for k = ±1 b) X[k] = 5 for k = ±1 c) X[k] = 2 / 5 for k = ±1 d) X[k] =10 for k = ±1

31 Which of the following is the condition for symmetry of Z parameters

a) $Z_{11} = 2 Z_{22}$ b) $Z_{11} = Z_{22}$ c) $Z_{22} = 2 Z_{11}$ d) $Z_{11} = 3Z_{22}$

32 In DC generators, armature reaction is produced actually by

a) Its field current b) Armature conductors c) Field pole winding d) Load current in armature

33 The number of select lines for 16 to 1 multiplexer is

a) 4 b) 5 c) 16 d) 6

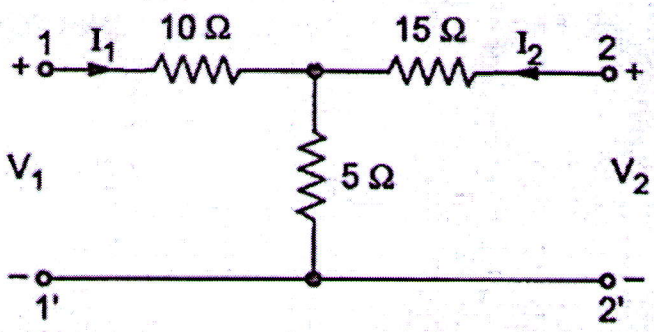
34 Which of the following element of hydroelectric power plant prevents the penstock from water hammer phenomenon?

a) Surge Tank b) Draft tubes c) Spillway d) Valves and Gates

35 FS representation of a periodic DT signal is

a) aperiodic b) periodic c) continuous d) discrete and aperiodic

36 For the given circuit, calculate the open circuit driving point input impedance



a) 5 Ω b) 10 Ω c) 20 Ω d) 15 Ω

37 As compared to shunt and compound DC motors, the series DC motor will have the highest torque because of its comparatively _____at the start.

a) Lower armature resistance b) Stronger series field c) Fewer series turns d) Larger armature current

38 For JK flip flop with J=1, K=0, the output after clock pulse will be

a) 0 b) 1 c) high impedance d) no change.

39 Which of the following is an essential requirement for a peak load plant?

a) Economical and speedy repair b) Capability of working continuously c) Low operating cost d) Capability of quick start

40 The relation between Laplace domain and Z domain is

a) $Z = e^{sT}$ b) $Z = e^{jsT}$ c) $S = e^{ZT}$ (d) d) $Z = e^{-sT}$

41 Driving point impedance is defined as

a) The ratio of transform voltage to transform current at the same port b) The ratio of transform voltage at one port to transform current at the other port c) Both a and b d) None of the above

42 A 4 pole lap wound dc shunt motor rotates at the speed of 1500 rpm, has a flux of 0.4mWb and the total number of conductors are 1000. What is the value of emf?

a) 100 Volts b) 0.1 Volts c) 1 Volt d) 10 Volts

43 The circuit which changes from serial data to parallel data is

a) COUNTER b) MULTIPLEXER c) DEMULTIPLEXER d) FLIP-FLOP

44 What of the below mentioned statements are incorrect as compared to the HVDC system?

a) Distance limitation b) Back to back connection is possible c) Extra reactive power compensation d) More corona losses

45 Z transform reduces to Fourier transform when it is evaluated on

a) a half circle b) Z circle c) unit circle d) imaginary circle

46 The initial value of $20 - 10t - e^{25t}$ is

a) 20 b) 19 c) 10 d) 25

47 In a dc shunt motor the terminal voltage is halved while the torque is kept constant. The resulting approximate variation in speed 'ω' and armature current 'I_a' will be

a) Both ω and I_a are doubled b) ω is constant and I_a is doubled c) ω is doubled while I_a is halved d) ω is constant but I_a is halved

48 Which of the following circuit can be designed using shift register?

a) Ring counter b) Asynchronous up counters c) Asynchronous down counters d) BCD to Decimal converter

49 Which of the following power plants can be profitably employed for supplying base loads as well as peak loads?

a) Diesel power plant b) Hydroelectric power plant c) Thermal power plant d) Nuclear power plant

50 When the system has poles inside the unit circle in Z domain,

a) the system is stable and its impulse response is a decaying function b) time domain behaviour will be exponentially rising signal c) the system is unstable d) the impulse response is marginally constant

*****