

Reg No.: _____

Name: _____

1100MRT308062302

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

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



Course Code: MRT 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. Which of the following law/rule can be used to determine the direction of rotation of D.C. motor?
a) Lenz's law b) Faraday's law c) Coloumb's law d) Fleming's left-hand rule
2. The armature of D.C. generator is laminated to
a) Reduce the bulk b) Provide the bulk c) Insulate the core d) Reduce eddy current loss
3. Brushes of D.C. machines are made of
a) Carbon b) Soft copper c) Hard copper d) All of above
4. A silicon controlled rectifier (SCR) is a
a) Uni junction device b) A device with three junction c) A device with four junction d) None of the above
5. The transformer ratings are usually expressed in.....
a) Volts b) Amperes c) kW d) kVA
6. Slip ring induction motor is employed only for
a) Speed control b) High starting torque c) Both (a) and (b) d) None of these
7. Which of the following motors is usually used in household refrigerators?
a) D.C. shunt motor b) D.C. series motor c) Single-phase induction motor (split phase start or induction run motor) d) Reluctance motor
8. The generator which gives dc supply to the rotor of an alternator is called a
a) Convertor b) Exciter c) Inverter d) Rectifier

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9. Universal motors are used in
a) Conveyor b) Food mixer c) Elevator d) Refrigerator
10. Inverter converts
a) DC to AC b) AC to DC c) DC to DC d) AC to AC
11. How many AND gates are required to realize $Y = CD + EF + G$?
a) 4 b) 5 c) 3 d) 2
12. A universal logic gate is one which can be used to generate any logic function. Which of the following is a universal logic gate?
a) OR b) AND c) XOR d) NAND
13. How many select lines would be required for an 8-line-to-1-line multiplexer?
a) 2 b) 4 c) 8 d) 3
14. If A and B are the inputs of a half adder, the carry is given by _____
a) A AND B b) A OR B c) A XOR B d) A EX-NOR B
15. The following switching functions are to be implemented using a decoder:
 $f_1 = \sum m(1, 2, 4, 8, 10, 14)$ $f_2 = \sum m(2, 5, 9, 11)$ $f_3 = \sum m(2, 4, 5, 6, 7)$
The minimum configuration of decoder will be _____
a) 2 to 4 line b) 3 to 8 line c) 4 to 16 line d) 5 to 32 line
16. In a J-K flip-flop, if $J=K$ the resulting flip-flop is referred to as _____
a) D flip-flop b) S-R flip-flop c) T flip-flop d) S-K flip-flop
17. The base current amplification factor β is given by _____
a) I_C/I_B b) I_B/I_C c) I_E/I_B d) I_B/I_E
18. Which of the following terminals does not belong to the MOSFET?
a) Drain b) Gate c) Base d) Source
19. Power amplifier directly amplifies _____
a) Voltage of signal b) Current of the signal c) Power of the signal d) All of the mentioned
20. Which of the following expression depicts Barkhausen criteria?

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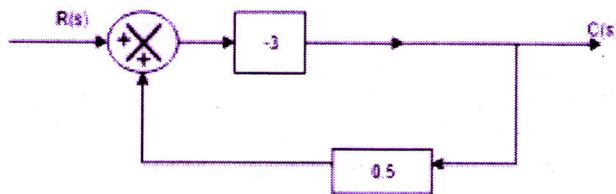
- a) $A\beta = 1$ b) $A\beta = 0$ c) $A\beta < 1 < A\beta$ d) $A\beta < 1$
- 21 Smallest change which a sensor can detect is _____
a) Resolution b) Accuracy c) Precision d) Scale
- 22 A one-way valve that lets air into the reservoir of a compressor, but doesn't let it out, is a
a) Check valve b) Receiver valve c) Control valve d) Three way valve
- 23 Smallest change which a sensor can detect is _____ a) Resolution b) Accuracy c) Precision d) Scale
a) b) c) d)
- 24 Starters are used in induction motor because
a) Its starting torque is high b)) It is run against heavy load c) It cannot run in reverse direction d) Its starting current is five times or more than its rated current
- 25 The scientific principle that makes hydraulic systems possible is
a) Pascal's principle. b) Boyle's law c) Bernoulli's principle d) The fluid flow principle
- 26 A variable reluctance stepper motor is constructed of _____ material with salient poles.
a) Paramagnetic b) Ferromagnetic c) Diamagnetic d) Non-magnetic
- 27 A stepping motor is a _____ device.
a) Mechanical b) Electrical c) Analogue d) Incremental
- 28 What does an Encoder do?
a) Senses mechanical motion b) Provides information concerning position, velocity and direction c) Converts analog into digital information d) All of the above
- 29 Which type of motion is transmitted by hydraulic actuators?
a) linear motion b) rotary motion c) both a and b d) none of the above
- 30 Which energy is converted into mechanical energy by the hydraulic cylinders?
a) hydrostatic energy b) hydrodynamic energy c) electrical energy d) none of the above

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- 31 Microprocessor can function as the CPU of a computer called a _____ .
a) Personal Computer b) Microcomputer c) Super Computer d) Desktop Computer
- 32 Which of the following part of the microprocessor is closely related to register?
a) Processor b) Memory c) ALU d) BUS
- 33 Maximum memory which can be interfaced with a 8085 microprocessor.
a) 32kB b) 64kB c) 128kB d) 256kB
- 34 An example of one byte instruction is _____.
a) CALL 2500H b) ADD B c) IN 80H d) MVI A, 24H
- 35 In an intel 8085A, which is the first machine cycle of an instruction?
a) An op-code fetch cycle b) A memory read cycle c) A memory write cycle d) An I/O read cycle
- 36 _____ is the only non-vectored interrupt in 8085 microprocessor.
a) TRAP b) RST 5.5 c) INTR d) RST 7
- 37 Which general register or general register pair is incremented/decremented by 2 during PUSH and POP instructions?
a) H-L b) D-E c) Stack Pointer d) Program Counter
- 38 CALL instruction is a _____ instruction.
a) 4 bytes b) 2 bytes c) 1 bytes d) 3 bytes
- 39 The instruction, CMP to compare source and destination operands it performs
a) addition b) subtraction c) division d) multiplication
- 40 In general, the destination operand of an instruction can be
a) memory location b) register c) immediate data d) memory location and register
- 41 What is the effect of feedback in the overall gain of the system?
a) Increases b) Decreases c) Zero d) No change
- 42 The overall transfer function of two blocks in parallel are :

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43. a) Sum of individual gain b) Product of individual gain c) Difference of individual gain d) Division of individual gain
- Effect of feedback on sensitivity is minimum in:
- a) Open loop control system b) Closed loop control system c) None d) Both
44. The closed system has higher _____ than open loop control system, this implies increased speed of response.
- a) Gain b) Bandwidth c) Frequency d) Speed
45. The closed loop gain of the system shown in the given figure is



- a) $-9/5$ b) $-6/5$ c) $6/5$ d) $9/5$
46. The transient response, with feedback system,
- a) Rises slowly b) Rises quickly c) Decays slowly d) Decays quickly
47. The type 0 system has _____ at the origin.
- a) No pole b) Net pole c) Simple pole d) Two poles
48. The position and velocity errors of a type-2 system are
- a) constant, constant b) constant, infinity c) zero, constant d) zero, zero
49. In case of type-1 system steady state acceleration is
- a) Unity b) Infinity c) Zero d) 10
50. Which of the following is the best method for determining the stability and transient response?
- a) Root locus b) Bode plot c) Nyquist plot d) None of the above