

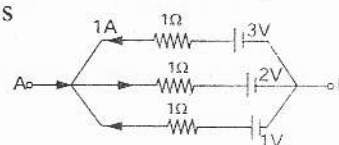
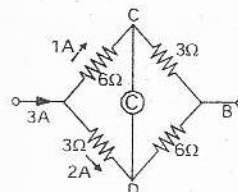
ECET

ACADEMY ECET / POLYCET  
DIPLOMA TUITIONS  
C. Siddannuram X Road,  
Pulshim nagar, Hyderabad.  
040-66662352/ 65552352  
9286352352/ 8143352552

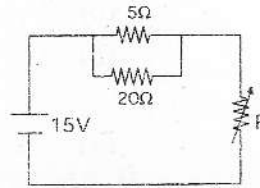
# ELECTRICAL AND ELECTRONICS ENGINEERING

## QUESTION PAPER-2013

- The strength of an electromagnet can be increased by ( )
  - Decreasing the length of the conductor
  - Increasing the length of the conductor
  - Increasing the number of turns
  - Decreasing the number of turns
- The best conductor amongst the following is ( )
  - Silver
  - Iron
  - Aluminium
  - Copper
- Energy stored in a capacitor is given by ( )
  - $E = 2C V^2$  Joules
  - $E = \frac{1}{2} CV$  calorie
  - $E = C^2V$  calorie
  - $E = \frac{1}{2} CV^2$  Joules
- An inductor at  $t = 0^+$  with initial current  $I_0$  acts as a ( )
  - Short circuit
  - Current source
  - Open circuit
  - Voltage source
- In the given circuit in below figure, \_\_\_\_\_ through the galvanometer ( )
  - No current flows
  - Small current flows C to D
  - Current flows D to C
  - High current flows C to D
- Potential difference between A and B in the given circuit is ( )
  - 6 V
  - 3 V
  - 1 V
  - 2 V

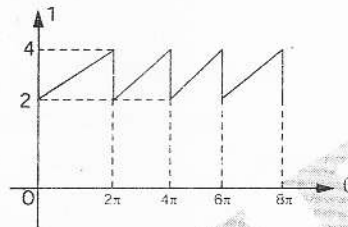


7. Power in  $5\Omega$  of circuit shown below is 20 watt, then the resistance R is ( )

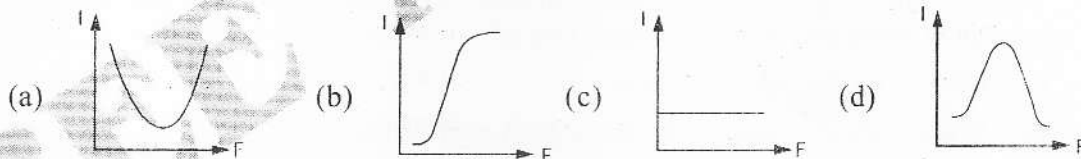


- (a)  $5\Omega$  (b)  $25\Omega$  (c)  $2\Omega$  (d)  $4\Omega$
8. The emf induced in the armature of a shunt generator is 600 V. The armature resistance is 0.1 ohm. If the armature current is 200A, the terminal voltage will be ( )  
 (a) 640 V (b) 620 V (c) 600 V (d) 580 V
9. If  $W_c$  is the constant loss and  $R_a$  is the armature resistance of a dc generator, then load current  $I_L$  corresponding to maximum efficiency is ( )  
 (a)  $I_L = \sqrt{\frac{R_a}{W_c}}$  (b)  $I_L = \frac{W_c}{\sqrt{R_a}}$  (c)  $I_L = \frac{R_a}{\sqrt{W_c}}$  (d)  $I_L = \sqrt{\frac{W_c}{R_a}}$
10. In generators, the rule used to know the direction of induced emf is ( )  
 (a) Screw rule (b) Thumb rule  
 (c) Flemings right hand (d) Flemings left hand
11. The demagnetizing flux in dc generators ( )  
 (a) Increase e.m.f (b) Decrease e.m.f  
 (c) Increases speed (d) Decreases speed
12. Which DC motor is preferred for elevators ( )  
 (a) Shunt motor (b) Series motor  
 (c) Differential compound motor (d) Cumulative compound motor
13. A 220V dc series motor is taking a current of 40A. Resistance of a armature =  $0.5\Omega$  and resistance of series field is  $0.25\Omega$ . What is the back emf when there is no brush drop ( )  
 (a) 190 V (b) 210 V (c) 180 V (d) 120 V
14. Rapid stopping of an electric motor by momentarily its connections to the supply is called ( )  
 (a) Jogging (b) Inching  
 (c) Plugging (d) Sequence operation
15. In dc motors, the condition for maximum power is ( )  
 (a) Supply voltage =  $\frac{1}{2} \times$  Back emf (b) Supply voltage =  $\sqrt{2} \times$  Back emf  
 (c) Back emf =  $\frac{1}{2} \times$  Supply voltage (d) Back emf =  $2 \times$  Supply voltage
16. The material used for making the coil of a standard resistance is ( )  
 (a) Copper (b) Nichrome (c) Constantan (d) Manganin

17. Creeping errors are found in ( )  
 (a) Voltmeter (b) Wattmeter  
 (c) Energy meter (d) Ampere-hour meter
18. Sensitivity of a voltmeter is expressed as ( )  
 (a) Volts/Ohm (b) Ohms/Volt (c) Ohms-Volt (d) Siemen/Volt
19. In a M C instrument, the deflecting torque is proportional to ( )  
 (a)  $I$  (b)  $I^2$  (c)  $\sqrt{I}$  (d)  $\sin\theta$
20. The period of  $\frac{1}{50}$  sec corresponds to a frequency of \_\_\_\_\_ Hz. ( )  
 (a)  $\frac{1}{50}$  (b) 50 (c)  $\sqrt{2}$  50 (d)  $\frac{50}{\pi}$
21. The average value of a sine wave is 100A. RMS value of the same wave is ( )  
 (a) 100A (b) 111A (c)  $100\sqrt{2}$  A (d)  $100\sqrt{3}$
22. For the wave shown below, the average value is ( )



- (a) 2A (b) 4A (c) 3A (d) 6A
23. In an R-L-C circuits,  $v(t) = 20 \sin(314t + 5\pi/6)$  and  $i(t) = 10 \sin(314t + 2\pi/3)$ . The power factor of the circuit is ( )  
 (a) 0.5 lead (b) 0.966 lag (c) 0.866 lead (d) 0.5 lag
24. The shape of the curve in series resonance current (I) versus frequency (F) ( )

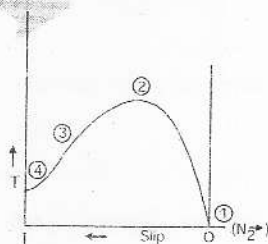


25. The eddy current loss of a 1- $\phi$  transformer at a frequency of 25 Hz is 40W. It's eddy current loss at 50 Hz frequency ( )  
 (a) 80 W (b) 160 W (c) 40 W (d) 20 W
26. The equivalent resistance of a transformer referred to secondary is given by ( )

(a)  $r_1 + r_2 \left( \frac{N_1}{N_2} \right)^2$  (b)  $r_2 + r_1 \left( \frac{N_1}{N_2} \right)^2$  (c)  $r_2 + r_1 \left( \frac{N_2}{N_1} \right)^2$  (d)  $r_1 + r_2 \left( \frac{N_2}{N_1} \right)^2$

27. The voltage drop in a transformer is given by ( )  
(a)  $I_1 R_1 \sin\theta + I_1 X_1 \sin\theta$  (b)  $I_1 R_1 \cos\theta + I_1 X_1 \cos\theta$   
(c)  $I_1 R_1 + I_1 X_1$  (d)  $I_1 R_1 \cos\theta + I_1 X_1 \sin\theta$
28. Distribution transformers are designed to keep core losses minimum and copper losses are relatively less important because ( )  
(a) The primary of such transformers are energized for all the 24 hours in a day and core loss occur throughout the day while copper loss occur only when the secondary is supplying the load  
(b) To ensure maximum All day efficiency  
(c) Great core losses may destroy its insulation  
(d) Greater core losses will heat up the oil of the transformer rapidly
29. The transformer oil is used in transformer to provide ( )  
(a) Lubrication and insulation (b) Insulation and cooling  
(c) Cooling and lubrication (d) Cooling, insulation and lubrication
30. Sumpner's test on two identical transformers yields information about ( )  
(a) Core losses only (b) Full load copper loss only  
(c) Both core and full load copper losses (d) It yields no information about losses
31. A  $\Delta/Y$  transformer has phase to phase voltage transformation ratio of  $a : 1$ . The line to line voltage ratio of  $Y/\Delta$  is given by ( )  
(a)  $\frac{a}{\sqrt{3}}$  (b)  $\frac{\sqrt{3}}{1}$  (c)  $\frac{\sqrt{3}}{a}$  (d)  $a$
32. A 3-phase 4-pole, 24 slot alternator has its armature coils short pitched by one slot. Its  $K_c$  will be ( )  
(a) 0.94 (b) 0.959 (c) 0.98 (d) 0.966
33. When two 50 Hz 3- $\phi$  alternators are operated in parallel in one of the machines tends to take more than its proportional amount of load. In order to distribute the load proportionately and still operate at rated frequency, it is necessary to ( )  
(a) Change the speed of alternator  
(b) Change speed excitation of one or both alternators  
(c) Insert impedance in series with the alternator taking more load  
(d) Increase the driving torque of one machine and reduce that of the other
34. The speed of an alternator is changed from 3000 r.p.m to 1500 r.p.m. The generated emf/phase will become ( )  
(a) One fourth (b) Roughly half (c) Double (d) Unchanged
35. If load (or torque) angle of 4-pole synchronous motor is  $8^\circ$  (elect.), its value in mechanical degrees is ( )  
(a) 4 (b) 2 (c) 0.5 (d) 8

36. The 'V' curves of a synchronous motor are drawn between \_\_\_\_\_ and \_\_\_\_\_ ( )  
 (a)  $I_a$  and p.f. (b) p.f. and  $I_f$  (c) V and p.f. (d)  $I_a$  and  $I_f$
37. A cylindrical - rotor synchronous motor is switched on to the supply with its field windings shorted on themselves. It will \_\_\_\_\_ ( )  
 (a) Not start  
 (b) Start but not run at synchronous speed  
 (c) Start as an induction motor and then run at synchronous speed  
 (d) Start and run as a synchronous speed
38. When the applied voltage to an induction motor is varied keeping the frequency at rated value ( )  
 (a) The torque varies in direct proportion to the voltage  
 (b) The torque varies in direct proportional to square of the voltage  
 (c) The torque varies in inverse proportional to the voltage  
 (d) The torque varies in inverse proportion to square of the voltage
39. A 3-phase 400 V 4-pole induction motor is fed from a 3-phase, 400V, 50 Hz supply and runs at 1440 rpm. The frequency of the rotor EMF is \_\_\_\_\_ Hz ( )  
 (a) 2 (b) 50 (c) 48 (d) 0
40. Out of the following methods of starting a three-phase induction motor which one requires six stator terminals ? ( )  
 (a) Star - delta (b) Rotor rheostat  
 (c) Auto transformer (d) Direct-on-line
41. In a 3-phase slip-ring induction motor, brushes are connected to ( )  
 (a) Dc supply (b) 3- $\phi$  ac supply  
 (c) External star connected resistors (d) Equalizing coils
42. Which point on the slip/torque graph shown in below figure represents the pull-out torque of an induction motor ? ( )



- (a) 1 (b) 3 (c) 2 (d) 4
43. Main advantage of capacitor run motor is ( )  
 (a) It provides starting torque  
 (b) Cheap  
 (c) It not only provides starting torque but also improves p.f.  
 (d) It is easy to manufacturers

44. Which of the following motors is used in mixers ( )  
(a) Repulsion motor (b) Reluctance motor  
(c) Hysteresis motor (d) Universal motor
45. Induced draft fans are located at ( )  
(a) The top (b) The bottom  
(c) In the middle (d) Can be any where of the cooling tower
46. The electrostatic precipitator is used to collect ( )  
(a) Voltage (b) Current (c) Dust (d) Ash
47. Major share of power produced in India is through ( )  
(a) Hydro power plants (b) Thermal power plants  
(c) Nuclear power plants (d) Diesel power plants
48. In hydel plant, the mechanical energy to run the alternator is obtained from ( )  
(a) Pump house (b) Penstock (c) Surge tank (d) Turbine
49. Demand factor is given by ( )  
(a)  $\frac{\text{Average load}}{\text{Max. demand}}$  (b)  $\frac{\text{Maximum demand}}{\text{Connected load}}$   
(c)  $\frac{\text{Connected load}}{\text{Max. demand}}$  (d)  $\frac{\text{Connected load}}{\text{Average load}}$
50. The main function of a fuse is to ( )  
(a) Open the circuit (b) Close the circuit  
(c) Allow excessive current (d) Prevent excessive current
51. Sparking between contacts can be reduced by inserting ( )  
(a) A capacitor in parallel with the contacts  
(b) A capacitor in series with the contacts  
(c) A resistor in the line  
(d) A reactor in the line
52. The arcing contacts in a circuit breaker are made of ( )  
(a) Porcelain (b) Copper tungsten alloy  
(c) Aluminium alloy (d) Electrolytic copper
53. The relay operating speed will not depend upon ( )  
(a) Flux build up (b) Armature core air gap  
(c) Spring tension (d) Material
54. The number of contacts in a 3-phase circuit breaker is ( )  
(a) 2 (b) 3 (c) 4 (d) 6
55. If height of the tower increases then sag practically ( )  
(a) Increases (b) Decreases  
(c) Remains same (d) Becomes zero



56. To reduce corona loss the shape of the conductor is ( )  
 (a) Circular (b) Square (c) Triangle (d) Strip
57. The number of strands in a stranded conductor can be determined by  $(N) =$  ( )  
 (a)  $3n(n+1)$  (b)  $3n(n+1)+1$  (c)  $2n(n^2+1)$  (d)  $3n(2n+1)$
58. Insulation resistance of the cable is given by ( )  
 (a)  $\frac{\rho}{2\pi} \log \frac{r_2}{r_1}$  (b)  $\frac{\rho}{2\pi l} \log \frac{r_2}{r_1}$  (c)  $\log \frac{r_2}{r_1} \times \frac{1}{l}$  (d)  $2\pi r / \log \frac{r_2}{r_1}$
59. In H.V.D.C. transmission \_\_\_\_\_ charging current are there ( )  
 (a) Less (b) High (c) No (d) Moderate
60. High voltage transmission lines consists of ( )  
 (a) Pin insulators (b) Suspension insulators  
 (c) Guy insulators (d) Reel insulators
61. Service mains feed electric power to ( )  
 (a) Consumers (b) Service mains (c) Distributors (d) Generally stations
62. The purpose of guard ring is to ( )  
 (a) Equalize various capacitance  
 (b) Equalize voltage drops across insulators  
 (c) Equalize the various insulators  
 (d) Ground against heavy voltages
63. In a distribution system which of the following items shares the major cost ( )  
 (a) Conductors (b) Earthing system  
 (c) Distribution transformer (d) Insulators
64. The distributors in residential areas are ( )  
 (a) Single phase two wire (b) Three phase three wire  
 (c) Two phase four wire (d) Three phase four wire
65. Trapezoidal speed time curve pertains to ( )  
 (a) Sub urban - service (b) Urban service  
 (c) Main line service (d) Urban and sub urban service
66. The speed of the train estimated taking in account the stoppage time at a station in addition to the actual running time between stops, is called the \_\_\_\_\_ speed ( )  
 (a) Average (b) Notching (c) Free running (d) Schedule
67. The type of dc motor used in electric traction is ( )  
 (a) Series motor (b) Shunt motor  
 (c) Cumulative compound motor (d) Differential compound motor
68. Kando system used for train electrification is the name used for ( )  
 (a) 1 phase to 3 phase (b) dc to 1 phase  
 (c) 1 phase to dc (d) 1 phase variable output

69. The requirement for ideal traction system is ( )  
(a) Maximum wear on track (b) Low adhesion coefficient  
(c) High adhesion coefficient (d) Complex speed control
70. Longer consisting period results in ( )  
(a) Higher schedule speed (b) Low specific energy consumption  
(c) Higher retardation (d) Higher acceleration
71. The current collector that can be employed with different speeds under all wind conditions and stiffness of over head electrification is known as ( )  
(a) Messenger collector (b) Pantograph collector  
(c) Trolley collector (d) Bow collector
72. Specific energy consumption is minimum is \_\_\_\_\_ services ( )  
(a) Main line (b) Urban (c) Suburban (d) Equal for all types
73. The material for conductor in a cable is ( )  
(a) Copper (b) Iron (c) Silicon steel (d) Rubber
74. The insulation resistance test is performed on power line with ( )  
(a) Ohm meter (b) Earth tester (c) Megger (d) Multimeter
75. The cheapest internal wiring is [3] ( )  
(a) Conduit wiring (b) CTS wiring  
(c) Cleat wiring (d) Casing and capping wiring
76. The  $I_{CBO}$  in a transistor can be reduced by reducing ( )  
(a)  $I_B$  (b)  $I_g$  (c)  $V_{CC}$  (d) Temperature
77. In an NPN transistor, the leakage current is due to ( )  
(a) Flow of minority carriers from collector to emitter  
(b) Flow of holes from base to emitter  
(c) Flow of electrons from collector to base  
(d) Flow of holes from collector to base
78. A full wave rectifier with 1 phase ac input is \_\_\_\_\_ converter ( )  
(a) 1 pulse (b) 2 pulse (c) 3 pulse (d) 6 pulse
79. In voltage amplifiers the load resistance should be ( )  
(a) As large as possible (b) As small as possible  
(c) Equal to input impedance (d) Equal to output impedance
80. An amplifier without feedback has a gain of 1000. What is its gain with a negative feedback of 0.009 ? ( )  
(a) 900 (b) 125 (c) 100 (d) 10
81. In a piezoelectric crystal oscillator, the oscillation or tuning frequency is linearly proportional to the ( )  
(a) Mass of the crystal (b) Square root of mass of crystal  
(c) Square of the mass of crystal (d) Inverse of square root of mass of crystal



82. An AND gate ( )
- (a) Implements logical addition
  - (b) Gives high output when all inputs are low
  - (c) Is equivalent to series switching circuit
  - (d) Is equivalent to parallel switching circuit
83. Which of the following complete sets of logic gates designated as universal gates is ( )
- (a) NOT, OR and AND gates
  - (b) XNOR, NOR and NAND gates
  - (c) NOR and NAND gates
  - (d) XOR, NOR and NAND gates
84. An n bit A/D converter is required to convert an analog input in the range 0.5V to an accuracy of 10mV. The value of n is ( )
- (a) 16
  - (b) 10
  - (c) 8
  - (d) 9
85. D-Flip-Flop can be made from a J-K Flip-Flop by making ( )
- (a)  $J = K$
  - (b)  $J = K = 1$
  - (c)  $J = 0, K = 1$
  - (d)  $J = K$
86. In a wein bridge oscillator if the resistances in the positive feedback circuit are decreased, the frequency ( )
- (a) Decreases
  - (b) Increases
  - (c) Remains the same
  - (d) Fluctuates in erratic fashion
87. When cathode of a thyristor is made more positive than its anode, then ( )
- (a) All the junctions are reverse biased
  - (b) Outer junctions are reversed biased and central one is forward biased
  - (c) Outer junctions are forward biased and central one is reversed biased
  - (d) All the junctions are forward biased
88. The Snubber circuit is used in thyristor circuits for ( )
- (a) Triggering
  - (b)  $\frac{dv}{dt}$  Protection
  - (c)  $\frac{di}{dt}$  Protection
  - (d) Phase shifting
89. In an SCR if latching current is  $I_L$  and holding current is  $I_H$  then the following relation hold good ( )
- (a)  $I_H > I_L$
  - (b)  $I_H \geq I_L$
  - (c)  $I_H = I_L$
  - (d)  $I_H < I_L$
90. Which one is most suitable power device for high frequency (> 100 KHz) switching application ( )
- (a) Power MOSFET
  - (b) BJT
  - (c) Schottky diode
  - (d) Microwave transistor


ACADEMY ECET / POLYCEET  
DIPLOMA TUTORIALS  
C. V. Raman X Road,  
P. V. Nagar, Hyderabad.  
04-66352352 / 05352352  
04-66352352 / 0143352352

91. For stator voltage control of 3 phase induction motor which of the following converter is used if the supply is 3 phase AC, 50 Hz ( )  
(a) PWM inverter  
(b) 3 phase AC voltage controller  
(c) Cycloconverter  
(d) 3 phase rectifier
92. A dc step down chopper has  $T_{on}$  of 1ms and its frequency is 500 Hz. What will be its duty ratio? ( )  
(a) 1 (b) 0.75 (c) 0.5 (d) 0.25
93. The output voltage and current waveform of a single phase fully controlled and half controlled converter will be same provided the extinction angle  $\beta$  is less than ( )  
(a)  $\pi + \alpha$  (b)  $\pi - \alpha$  (c)  $\pi$  (d)  $2\pi$
94. A PWM inverter is capable of producing the following type of output voltage ( )  
(a) Variable in magnitude and frequency  
(b) Variable voltage, fixed frequency  
(c) Fixed voltage, variable frequency  
(d) Fixed voltage, fixed frequency
95. In a single phase to single phase cycloconverter if  $\alpha_1$  and  $\alpha_2$  are the trigger angles of positive converter and negative converter, then ( )  
(a)  $\alpha_1 + \alpha_2 = \pi/2$  (b)  $\alpha_1 + \alpha_2 = \pi$   
(c)  $\alpha_1 + \alpha_2 = 3\pi/2$  (d)  $\alpha_1 + \alpha_2 = 2\pi$
96. When fed from a fully controlled converter, a dc motor, driving an active load can operate in ( )  
(a) Forward motoring and reverse braking mode  
(b) Forward motoring and forward braking mode  
(c) Reverse motoring and reverse braking mode  
(d) Reverse motoring and forward braking mode
97. Program Status Word (PSW) in 8051 is \_\_\_\_\_ bit ( )  
(a) 4 (b) 8 (c) 16 (d) 32
98. Internal clock frequency of 8051 is ( )  
(a) 3 MHz (b) 5 MHz  
(c) 10 MHz (d) 12 MHz
99. Which of the following register has no internal address? ( )  
(a) PC (b) DPTR  
(c) ACCUMULATOR (d) PSW
100. The number of registers in 8051 is ( )  
(a) 16 (b) 8 (c) 32 (d) 34

# KEY LIST

1. c	2. a	3. d	4. b	5. a	6. d	7. c	8. d	9. d	10. c
11. b	12. d	13. a	14. c	15. c	16. b	17. c	18. b	19. a	20. b
21. b	22. c	23. b	24. d	25. b	26. c	27. d	28. a	29. b	30. c
31. c	32. d	33. d	34. b	35. a	36. d	37. b	38. b	39. a	40. a
41. c	42. c	43. c	44. d	45. a	46. d	47. b	48. d	49. b	50. d
51. a	52. b	53. d	54. d	55. c	56. a	57. b	58. b	59. c	60. b
61. a	62. b	63. c	64. d	65. c	66. d	67. a	68. a	69. c	70. b
71. b	72. a	73. a	74. c	75. c	76. d	77. d	78. b	79. a	80. c
81. d	82. c	83. c	84. d	85. d	86. b	87. b	88. b	89. d	90. a
91. b	92. c	93. c	94. a	95. b	96. a	97. b	98. d	99. a	100. d


**ACADEMY POINT POLYMERS**  
 DISTRICT HEADQUARTERS  
 6-44-1, 2nd Floor, K. Road,  
 Dilshad Nagar, Hyderabad.  
 040-6632252 / 6632352  
 9808323377 / 980832352


**SAT**