

## Name: Question bank

Q1. A lamp having mean spherical candle power of 800 is suspended at a height of 10 m. Calculate the illumination just below the lamp.

- a) 8000 lux                      d) 8 lux                      c) 80 lux                      d) 800 lux

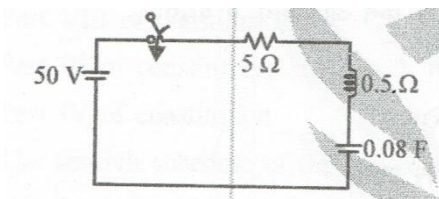
Q2. Hydrogen is used in large alternators mainly to:-

- a) Reduce eddy current losses  
b) Reduce distortion of wave from  
c) Cool the machine  
d) Strengthen the magnetic field

Q3. Two wires A and B have the same cross-section and are made of the same  $R_A = 800 \Omega$   $R = 100 \Omega$ . The number of times A is longer than B is:-

- a) 5                      b) 6                      c) 2                      d) 4

Q4. In the circuit shown in figure, find the transient current  $i(t)$  when the switch is closed at  $t = 0$ . Assume zero initial condition:-



- a)  $50 t e^{-0.5t}$                       b)  $50 t e^{-5t}$                       c)  $100 t e^{-5t}$                       d)  $100 t e^{-0.5t}$

Q5. The Ebers-Moll model is applicable to:-

- a) JEET                      b) BJT                      c) N MOS transistor                      d) UJT

Q6. A d. c. voltmeter has a sensitivity of  $1000 \Omega / \text{watt}$ . When it measures half full scale in 100 V range, the current through the voltmeter will be:-

- a) 50 mA                      b) 100 mA                      c) 1 mA                      d) 0.5 mA

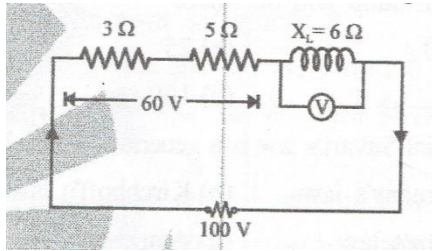
Q7. A delta-star transformer has a phase voltage transformation ratio of  $a : 1$  [delta phase : star phase]. The line to line voltage ratio of Star-delta is given by:-

- a)  $a/1$                       b)  $\sqrt{3}/Va$                       c)  $\sqrt{3}/1$                       d)  $\sqrt{3}/a$ ;-

Q8. Which of the following motors can be run on A.C. as well as a D.C. supply:-

- a) Reluctance motor                      b) universal motor                      c) Repulsion motor                      d) synchronous motor

Q9. The power factor of the circuit shown in figure:- (fig)



- a) 0.75 lagging      b) 0.3 lagging      c) 0.6 lagging      d) 0.8 lagging

Q10. The power factor of an a.c. circuit is given by:-

- a)  $R/Z$       b)  $X_L/R$       c)  $Z/R$       d)  $R/X_L$

Q11. A synchronous motor working at leading power factor can be used as:-

- a) Mechanical synchronizer      b) voltage booster      c) phase advancer      d) noise generator

Q12. A 150 V d.c. motor of armature resistance  $0.4 \Omega$  has back emf of 142 V. the armature current is:-

- a) 100 A      b) 10 A      c) 20 A      d) 150 A

Q13. As compared to full-wave rectifier using two diodes the four diode bridge rectifier has the dominant advantage of:-

- a) Higher efficiency      b) higher current carrying capacity  
c) lower peak inverse voltage requirement      d) lower ripple factor

Q14. Speed of the megger is kept at:-

- a) 160 rpm      b) 100 rpm      c) 120 rpm      d) 140 rpm

Q15. Two 100 W, 200 V lamps are connected in series across a 200 V supply. The total power consumed by each lamp will be watts:-

- a) 200      b) 25      c) 50      d) 100

Q16. The Biot-Savart's law is a general modification of :-

- a) Faraday's laws      b) Kirchhoff's law      c) Lenz's law      d) Ampere's law

Q17. The active and reactive power of an inductive circuit are 60 W and 80 VAR respective. The power factor of the circuit is:-

- a) 0.8 lag      b) 0.5 lag      c) 0.6 lag      d) 0.75 lag

Q18. For which of the following the excitation control method is satisfactory:-

- a) Long lines      b) Low voltage      c) high voltage lines      d) short lines

Q19. The type of protection that does not respond to faults occurring beyond its zone even though the fault current may pass through the zone is:-

- a) Back-up protection      b) Busbar protection      c) unit protection      d) generator protection

Q20. If  $F$  is the load factor, the loss load factor is given by:-

- a)  $0.35 F + 0.7 F^2$       b)  $0.25 F + 0.75 F^2$       c)  $0.25 F^2 + 0.85 F$       d)  $0.75 F + 0.25 F^2$

Q21. In a  $3 \frac{1}{2}$  digit voltmeter, the largest number that can be read is:-

- a) 9 9 9 9    b) 0 9 9 9    c) 1 9 9 9    d) 5 9 9 9

Q22. In suburban services as compared with urban service:-

- a) The coasting period is smaller but free running  
b) The coasting period is smaller  
c) The coasting period is longer  
d) The coasting period and free running period are same

Q23. Quadrilateral speed time curve is used for:-

- a) Goods line service    b) sub urban service    c) urban service    d) main line service

Q24. Which of the following motor will give relatively high starting torque:-

- a) Shaded pole motor    b) Capacitor start motor  
c) Capacitor run motor    d) Split phase motor

Q25. The current in reverse bias in P-N junction diode may be:-

- a) Between 2A and 5A    b) few micro or nano amperes  
c) fewmilli amperes    d) between 0.2 A and 2 A

Q26. The repulsion-start induction-run motor is used because of:-

- a) High starting torque    b) good power factor    c) high efficiency    d) minimum cost

Q27. Which of the following is non-linear circuit parameter?

- a) Transistor    b) inductance    c) condenser    d) Wire wound resistor

Q28. The B-H curve is used to find the mmf of the section of the magnetic circuit. The section is:-

- a) Vacuum    b) iron part    c) air gap    d) both iron part and air gap

Q29. A terminal where three or more branches meet is known as:-

- a) Mesh    b) node    c) terminal    d) loop

Q30. For V-curve for a synchronous motor the graph is drawn between:-

- a) Armature current and power factor    b) Field current and armature current  
c) Terminal voltage and load factor    d) Power factor and field current

Q31. Bundled conductors in EHV transmission system provide:-

- a) Increases corona loss    b) increases line reactance  
c) reduced line capacitance    d) reduced voltage gradient

Q32. Welding is injurious to eye because of:-

- (i) Infrared radiation  
(ii) Ultraviolet radiation

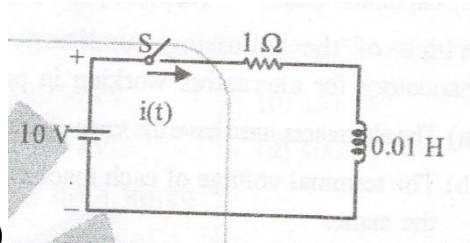
Among the above two, choose the correct one from the following choices:-

- a) Both are wrong      b) (i) along is correct      c) (ii) along is correct      d) both are correct

Q33. The rated speed of a given d.c. shunt motor is 1050 r.p.m To run this machine at 1200 r.p.m the following speed control scheme will be used:-

- a) Varying frequency    b) Armature circuit resistance control    c) Field resistance control    d) ward-Leonard control

Q34. After closing the switch 's' at  $t = 0$ , the current  $i(t)$  at any instant 't' in the network shown in the figure:-



- a)  $10 - 10 e^{-100t}$       b)  $10 - 10 e^{100t}$       c)  $10 - 10 e^{-100t}$       d)  $10 + 10 e^{-100t}$

Q35. To increase the range of an a.c. ammeter you would use:-

- a) A condenser across the meter      b) Current transformer  
c) A potential transformer      d) An inductance across the meter

Q36. The voltage across 5 H inductor is:-

$$V(t) = \begin{cases} 30t^2, & t > 0 \\ 0, & t < 0 \end{cases}$$

$$\{ 0, t > 0 \}$$

Find the energy stored at  $t = 5$  s. Assume zero initial current :-

- a) 312.5 kJ      b) 0.625 kJ      c) 3.125 kJ      d) 156.25 kJ

Q37. The energy stored in the magnetic field of a solenoid 30 cm long and 3 cm diameter with 1,000 turns of wire carrying current of 10A is:-

- a) 1.15 J      b) 0.015 J      c) 0.15 J      d) 0.5 J

Q38. In a power plant if the maximum demand on the plant is equal to the plant capacity, then:-

- a) Load factor will be nearly 60%      b) plant reserve capacity will be zero  
c) diversity factor will be unity      d) load factor will be unity

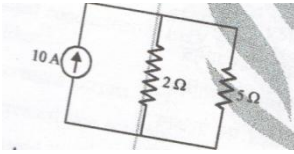
Q39. The least expensive fractional horse power motor is.....motor:-

- a) A.C. series      b) shaded pole      c) capacitor start    d) split phase

Q40. Which of the following condition is NOT mandatory for alternators working in parallel?

- a) The alternators must have the same phase sequence  
b) The terminal voltage of each machine must be the same  
c) The machines must have equal k VA ratings  
d) The alternators must operate at the same frequency

Q41. Find the current 5Ω resistor:



- a) 3.5 A                      b) 7.15 A                      c) 5 A                      d) 2.85 A

Q42. An isolator is used in series with Air blast circuit Breaker employed at UHV lines because:-

- a) Circuit breaker life is enhanced with the use of isolator
- b) Current to be interrupted will be large
- c) Gap between circuit breaker contacts is small
- d) Gap between circuit breaker poles is small

Q43. Diversity factor has direct effect on the :-

- a) Operating cost of unit
- b) Fixed cost of the unit generated
- c) Variable cost of the unit generated
- d) Both variable and fixed cost of unit generated

Q44. Regulation of an alternator supplying resistive or inductive load is:-

- a) Infinity                      b) always negative                      c) always positive                      d) zero

Q45. The highest transmission a.c. voltage in India is:-

- a) 1750 kV                      b) 132 kV                      c) 220 kV                      d) 400 kV

Q46. Point out the WRONG statement:-

The magnetising force at the centre of a circular coil varies

- a) Inversely as its radius                      b) directly as the number of its turns
- c) directly as the current                      d) directly as its radius

Q47. The rotor slots in an induction motor are usually not quite parallel to the shaft because it:-

- a) Improves the power factor
- b) improves the efficiency
- c) help the rotor teeth to remain under the stator teeth
- d) helps in reducing the tendency of the rotor teeth to remain under the stator teeth

Q48. If a 10 μF capacitor is connected to voltage source with  $V(t) = 50 \sin 2000 t$  V, then the current through the capacitor is.....A:-

- a)  $10^6 \cos 2000 t$                       b)  $5 \times 10^{-4} \cos 2000 t$                       c)  $\cos 2000 t$                       d)  $500 \cos 2000 t$

Q49. In a series resonance circuit, the impedance at half power frequencies is:-

- a) 2R                      b)  $R/\sqrt{2}$                       c)  $\sqrt{2}R$                       d)  $R/2$

Q50. A 10 Ω resistive load is to be impedance matched by a transformer to a source with 6250 Ω of internal resistance. the ratio of primary to secondary turns of transformer should be:-

- a) 25                      b) 10                      c) 15                      d) 20

Q51. The synchronous speed of a three phase induction motor having 20 pole and connected to a 50 Hz source is:-

- a) 1200 rpm      b) 300 rpm      c) 600 rpm      d) 1000 rpm

Q52. A circuit with a resistor, inductor and capacitor in series is resonant of  $f_0$  Hz. If all the component values are now double the new resonant frequency is:-

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

Q53. A 2 cm long coil has 10 turns and carries a current of 750 mA. The magnetising force of coil is:-

- a) 375 AT/m      b) 225 AT/m      c) 675 AT/m      d) 450 AT/m

Q54. A consumer has annual Consumption of 7,00, 800 units. If his maximum demand is 200 kW. The load factor will be:-

- a) 70%      b) 20%      c) 40%      d) 50%

Q55. The rated voltage of a 3-phase power system is given as:-

- a) Peak line to line voltage      b) rms phase voltage  
c) peak phase voltage      d) rms line to line voltage

Q56. For half wave rectified sine wave the ripple factor is:-

- a) 1.00      b) 1.65      c) 1.45      d) 1.21

Q57. Which one of the Following bridges is generally used for measurement of frequency and also capacitance?

- a) Wine bridge      b) Hay's bridge      c) Owen's bridge      d) Schering bridge

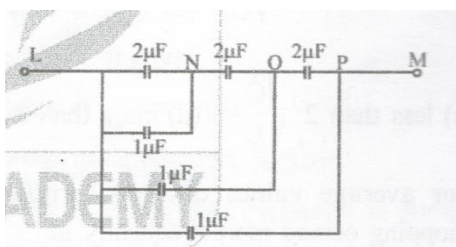
Q58. Two voltmeters of (0-300 V) range are connected in parallel to a.c. circuit. One voltmeter is moving iron type reads 200 V. if the other is PMMC instrument, its reading will be:-

- a) 127.4 V      b) slightly less 200 V  
c) Zero      d) 222 V

Q59. The least number of 1- $\phi$  watt meters required to measure total power consumed by an unbalanced load fed from a 3 $\phi$ , 4 wire system is:-

- a) 4      b) 1      c) 2      d) 3

Q60. Total capacitance between the point L and M in figure is:- (fig)



- a)  $4.05\mu\text{F}$       b)  $1.45\mu\text{F}$       c)  $1.85\mu\text{F}$       d)  $2.05\mu\text{F}$

Q61. EMF induced in a coil rotating in a uniform magnetic field will be maximum when the:-

- a) Rate of cutting flux by the coil sides is minimum.

- b) Flux linking with the coil is maximum
- c) Rate of change of flux linkage is minimum
- d) Rate of change of flux linkage is maximum

Q62. If resistance is  $20\ \Omega$  and inductance is 2 H in a RL series circuit then time constant of this circuit will be:

- a) 100s
- b) 0.001s
- c) 0.1s
- d) 10s

Q63. When the rotor of a three phase induction motor is blocked the slip is:-

- a) 1
- b) 0
- c) 0.1
- d) 10s

Q64. The positive, negative and zero sequence impedances of 3-phase synchronous generator are  $j\ 0.5\ \text{p.u.}$ ,  $j\ 0.3\ \text{p.u.}$  and  $0.2\ \text{p.u.}$  respectively. When symmetrical fault occurs on the machine terminals. Find the fault current. The generator neutral is grounded through reactance of  $j\ 0.1\ \text{p.u.}$

- a)  $-j\ 3.33\ \text{p.u.}$
- b)  $-j\ 1.67\ \text{p.u.}$
- c)  $-j\ 2.0\ \text{p.u.}$
- d)  $-j\ 2.5\ \text{p.u.}$

Q65. Transient current in RLC circuit is oscillatory when the value of R is:-

- a) More than  $2\sqrt{L/C}$
- b) less than  $2\sqrt{L/C}$
- c) less than  $2\sqrt{C/L}$
- d) More than  $2\sqrt{L/C}$

Q66. For average values of load current, current chopping occurs more frequently in:-

- a) VCB's
- b) OCB's
- c) ACB's
- d) SF<sub>6</sub>CB's

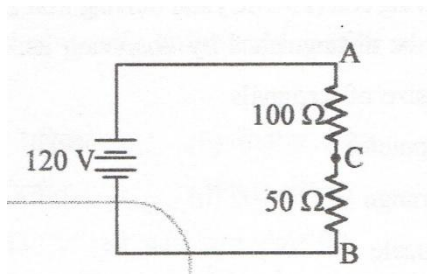
Q67. A BJT is said to be operating in the saturation region if:-

- a) Both the junction are forward biased
- b) Both the junction are reverse biased
- c) B-E junction is reverse biased and B-C junction is forward biased
- d) B-E junction is forward biased and B-C junction is reverse biased

Q68. The mutual inductance between two unity coupled coils of 9 H and 4 H will be:-

- a) 36 H
- b) 2.2 H
- c) 6 H
- d) 13 H

Q69. Determine the voltage at point C shown below with respect to ground:-



- a) 80 V
- b) 120 V
- c) 40 V
- d) 71 V

Q70. The efficiency normally obtained in a circuit under the conditions of maximum power transfer is:-

- a) 100%
- b) 25%
- c) 50%
- d) 75%

Q71. A magnet is kept in the medium of air surrounded by an iron ring. The magnetic lines of force from the magnet will be:-

a) Very small in the ring   b) Crowded in the ring   c) passing out of the ring   d) Evenly distributed within the ring

Q72. Which semiconductor device behaves like two SCR's :-

a) Triac      b) MOSFET      c) JEET      d) UJT

Q73. Three resistors each of ' $R$ '  $\Omega$  are connected in star. What is the value of equivalent delta connected resistors:

a)  $3R \Omega$                       b)  $R/2 \Omega$                       c)  $2R \Omega$                       d)  $R/3 \Omega$

Q74. Super position theorem can be applied only to:-

a) Bilateral networks                      b) linear networks                      c) non-linear networks      d) linear bilateral networks

Q75. Moving coil (PMMC) and moving iron instruments can be distinguished by observing its:-

a) Size of terminals                      b) pointer                      c) range      d) scale

Q76. In a fluorescent tube circuit, the function of choke is primarily to:-

a) Improve the brightness of the tube      b) initiate the discharge  
c) reduce the flicker                      d) reduce the starting current

Q77. The magnetic field energy in an inductor changes from maximum value to minimum value in 5 m sec when connected to an A.C source. The frequency of the source is:-

a) 500 Hz                      b) 20 Hz      c) 50 Hz                      d) 200 Hz

Q78. The distribution losses that the utility suffers while transferring power from generating station to the consumer is accounted under:-

a) Maintenance cost                      b) Fixed charges      c) running charges                      d) cost of fuel

Q79. The magnetic potential difference in a magnetic circuit is given by:-

a)  $B/H$                       b)  $H/l$                       c)  $B/l$                       d)  $H/l$

Q80. Two electric bulbs have tungsten filament of same thickness if one of the given 60 W and the other given 100 W, then:-

a) 60 W and 100 W lamp filaments have equal length      b) 60 W lamp filament has shorter length  
c) 100 W lamp filament has longer length                      d) 60 W lamp filament has longer length

Q81. A capacitor with no initial charge at  $t = 0$  acts:-

a) Open-circuit                      b) voltage source      c) current source      d) short-circuits

Q82. " danger 440 V" plates are:-

a) Informal notices                      b) danger notices      c) caution notices      d) advisory notices

Q83. Find  $R_3$  for the circuit shown in figure:-





Q93. A magnetic circuit carries a flux  $\phi_1$ , in the iron part and a flux  $\phi_g$  in the air gap. Then leakage co-efficient is:-

- a)  $\phi_1\phi_g$       b)  $\phi_1/\phi_g$       c)  $\phi_g/\phi_1$       d)  $\phi_g \times \phi_1$

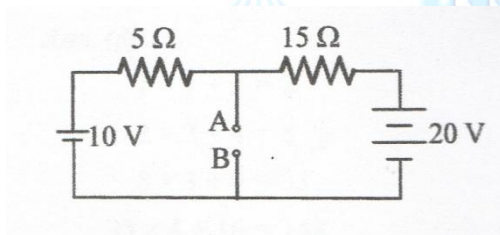
Q94. The maximum demand of a consumer is 2 kW and his daily energy consumption is 20 units, his load factor is:-

- a) 21%      b) 10.15%      c) 41.6%      d) 50%

Q95. A wheat stone bridge has ratio arm of 1000  $\Omega$  and 100  $\Omega$  resistances, the standard resistance arm consist of 4 decade resistance boxes of 1000, 100, 10, 1  $\Omega$  steps. The maximum and minimum value of unknown resistance that can be determined with this setup are:-

- a) 111100  $\Omega$  , 10  $\Omega$       b) 111100  $\Omega$  , 1  $\Omega$       c) 11110  $\Omega$  , 10  $\Omega$       d) 10000  $\Omega$  , 10  $\Omega$

Q96. Thevenin's equivalent voltage and resistance between the terminal A and B for network of given figure is:- ( fig)



- a) 2.5 V, 12.5  $\Omega$       b) 2.5 V, 3.75  $\Omega$       c) 12.5 V, 3.75  $\Omega$       d) 12.5 V, 2.5  $\Omega$

Q97. Low frequency operation of a.c. series motor in traction application:-

- a) Improve its commutation but starting current increases  
 b) Improve its commutation property but pf and n reduces  
 c) Improve its commutation, pf and efficiency  
 d) Adversely affects commutation but pf and n improve

Q98. The speed of a p-pole synchronous machine in r.p.m is given by:-

- a) 120 f p      b) 120 f/P      c) 120 P/f      d)  $\sqrt{120}$  fp

Q99. Which of the following motor has high starting torque:-

- a) Synchronous motor      b) a.c. series motor      c) d.c. series motor      d) induction motor

Q100. Which is the order of minimum displacement that can be measured with capacitive transducers:-

- a)  $1 \times 10^{-12}$ m      b) 1 cm      c) 1 mm      d) 1  $\mu$ m