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Test Booklet Series

Serial No. **1680**

D

SCREENING TEST – 2006

SUBJECT : ELECTRICAL ENGINEERING

*Time Allowed : **Two Hours***

*Maximum Marks : **120***

INSTRUCTIONS

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Screening Test - 2006

SUBJECT : ELECTRICAL ENGINEERING

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1. In a piezo-electric crystal oscillator, the oscillation or tuning frequency is linearly proportional to the
   (a) Mass of the crystal
   (b) Square root of the mass of the crystal
   (c) Square of the mass of the crystal
   (d) Inverse of the square root of the mass of the crystal

2. Which of the following best represents the bandwidth of an actual op amp
   (a) 100 Hz to 1 MHz
   (b) 0 Hz to 100 kHz
   (c) 0 Hz to 10 MHz
   (d) 0 Hz to infinity

3. In a CE amplifier the input impedance is equal to the ratio of
   (a) ac base voltage to ac base current
   (b) ac base voltage to ac emitter current
   (c) ac emitter voltage to ac collector current
   (d) ac collector voltage to ac collector current

4. An RC coupled amplifier has an open loop gain of 200 and a lower cut-off frequency of 50 Hz. If negative feedback with $\beta = 0.1$ is used, the lower cut-off frequency will be
   (a) about 50 Hz
   (b) about 5 Hz
   (c) about 2.8 Hz
   (d) about 50.1 Hz

5. In a p-type material, the Fermi level is 0.3 eV above the valence band. The concentration of acceptor atoms is doubled, the new position of the Fermi level is likely to be
   (a) 0.5 eV above the valence band
   (b) 0.28 eV above the valence band
   (c) 0.1 eV above the valence band
   (d) below the valence band

6. A transistor amplifier is operating in class-A mode. If a transformer is connected for impedance matching, the efficiency will
   (a) increase
   (b) decrease
   (c) not be affected
   (d) may increase or decrease

7. A push-pull amplifier is used as
   (a) Power amplifier
   (b) Voltage amplifier
   (c) Current amplifier
   (d) Both power and current amplifier

8. In Zener diode large reverse current is due to
   (a) Rupture of bonds
   (b) Collision
   (c) Low resistance in reverse bias region
   (d) Presence of impurities

9. The di/dt capability of a thyristor is decided by

(a) The spreading velocity of the current across the junction

(b) Voltage rating of the thyristor

(c) Reverse blocking capability of the device

(d) The steady state forward losses of the device

10. What is the basis for switching protection of a transistor

(a) Turn on and commutating limit

(b) Safe operating area

(c) OFF state and reapplied limit

(d) ON state voltage

11. In a digital voltmeter, the oscillator frequency is 400 kHz, the ramp voltage falls from 8 to 0 V in 20 m/sec. The number of Pulses counted by the counter is

(a) 8000

(b) 4000

(c) 3200

(d) 1600

12. The bridge used for measuring inductance of a low Q-inductor is

(a) Maxwell's

(b) Hay's

(c) Wien

(d) Anderson

13. Anderson bridge is used for the measurement of

(a) Time period

(b) Phase difference

(c) Inductance

(d) Capacitance

14. In Lorentz method for absolute measurement of resistance two measurements are taken, one with current in one direction and the other with the current reversed in order to

(a) Eliminate the effect of earth magnetic field upon the emf induced in the disk completely

(b) Eliminate the effect of thermo-emf at the brush contact

(c) Eliminate the effect of temperature on coil and disk

(d) Eliminate the effects of both thermo-emf and temperature

15. W_1 and W_2 are the reading of two watt meters used to measure power of a 3-phase balanced load. The reactive power drawn by the load is

(a) $W_1 + W_2$

(b) $W_1 - W_2$

(c) $\sqrt{3}\ (W_1 + W_2)$

(d) $\sqrt{3}\,(W_1 - W_2)$

16. For measuring very high resistance we should use

(a) Kelvin's double bridge

(b) Whetstone bridge

(c) Megger

(d) None of the above

17. The patterns used to measure phase and frequency with a cathode ray oscilloscope are called

(a) Lissajous pattern

(b) Faraday's pattern

(c) Ohm's pattern

(d) Phillips pattern

18. The time base signal in a CRO is

(a) A sinusoidal signal

(b) A square wave signal

(c) A saw tooth signal

(d) A triangular wave signal

19. Two voltmeters of 0-300 V range are connected in parallel to an AC circuit. One voltmeter is moving iron type and reads 200 V. If the other voltmeter is moving coil type, its reading will be

(a) $200\sqrt{3}$ V

(b) $200\sqrt{2}$ V

(c) Slightly less than 200 V

(d) Zero

20. One of the control spring of a permanent magnet moving coil ammeter is broken. If connected in a circuit, the meter would read

(a) Zero

(b) Half the correct value of the current

(c) Twice the correct value of the current

(d) An indefinite figure

21. Integrating meters are used for the measurement of

(a) Voltage

(b) Current

(c) Phase

(d) Energy

22. For absolute measurement of current the method commonly used is

(a) Electro-dynamometer method

(b) Tangent galvanometer method

(c) Rayleigh current balance method

(d) Lorenz method

23. Standing wave ratio of a transmission line SWR is a measure of the reflection phenomena, and in terms of voltage reflecting coefficient Γ_V it is

(a) $SWR = 1+|\Gamma_V|$

(b) $SWR = 1-|\Gamma_V|$

(c) $SWR = [1+|\Gamma_V|]\,[1-|\Gamma_V|]$

(d) $SWR = [1+|\Gamma_V|]/[1-|\Gamma_V|]$

24. Reflection factor for an incident wave which is normal on the perfect dielectric is [ε_1 = permitivity of first medium: ε_2 = permitivity of second medium]

(a) $\dfrac{\varepsilon_1}{\varepsilon_1 + \varepsilon_2}$

(b) $\dfrac{\sqrt{\varepsilon_1}}{\varepsilon_1 + \varepsilon_2}$

(c) $\dfrac{\sqrt{\varepsilon_1}}{\sqrt{\varepsilon_1} + \sqrt{\varepsilon_2}}$

(d) $\dfrac{2\sqrt{\varepsilon_1}}{\sqrt{\varepsilon_1} + \sqrt{\varepsilon_2}}$

25. Polarization of EM is due to the

(a) attenuation of the curve

(b) reflection of the wave

(c) transverse nature of the wave

(d) parallel nature of the wave

26. The depth of pentration δ at a frequency of 1 MHz for a material having conductivity 100 M Ω m^{-1} and permeability $1/\pi$ is

(a) $\pi \times 10^{-6}$ m

(b) $\pi \times 10^{-4}$ m

(c) 1×10^{-4} m

(d) $1/\pi \times 10^{-4}$ m

27. The intrinsic impedance of a good conducting medium is

(a) $\sqrt{\dfrac{\omega\mu}{\sigma}}\angle 0°$

(b) $\sqrt{\dfrac{\omega\mu}{\sigma}}\angle 45°$

(c) $\sqrt{\dfrac{\omega\mu}{\sigma}}\angle \dfrac{\pi}{2}$

(d) $\sigma\sqrt{\omega\mu}\angle \dfrac{\pi}{2}$

28. Poynting theorem relates electric intensity E and magnetic intensity H to the rate of energy flow per unit area at a point P as

(a) P = H Curl E

(b) P = E/H

(c) P = H/E

(d) P = E × H

29. According to Snell's law for electromagnetic waves [θ_i and θ_r are the incident and refracted angles, η_1 and η_2 are the intrinsic impedances of medium 1 and 2]

(a) $\dfrac{\cos\theta_r}{\cos\theta_i} = \dfrac{\eta_1}{\eta_2}$

(b) $\dfrac{\theta_r}{\theta_i} = \dfrac{\eta_1}{\eta_2}$

(c) $\dfrac{\sin\theta_r}{\sin\theta_i} = \dfrac{\eta_1}{\eta_2}$

(d) $\dfrac{\sin\theta_r}{\sin\theta_i} = \dfrac{\eta_2}{\eta_1}$

30. The total electric and magnetic intensities E and H respectively are related for a uniform plane wave as

(a) $EH = \mu_0$

(b) $EH = \varepsilon_0$

(c) $\dfrac{E}{H} = \dfrac{\mu_0}{\varepsilon_0}$

(d) $\dfrac{E}{H} = \sqrt{\dfrac{\mu_0}{\varepsilon_0}}$

31. The energy density of a magnetic field H is

(a) $\frac{\mu H}{2}$

(b) $\frac{\mu H^2}{2}$

(c) $\frac{\mu\sqrt{H}}{2}$

(d) μH

32. Gauss's law relates the electric field intensity E with volume charge density ρ at a point as

(a) $\nabla x E = \varepsilon_0 \rho$

(b) $\nabla x E = \rho/\varepsilon_0$

(c) $\nabla . E = \nabla\rho/\varepsilon_0$

(d) $\nabla . E = \rho/\varepsilon_0$

33. A stable feedback control system has open-loop transfer function with a pole and zero in RHP. The corresponding Nyquist plot will

(a) Encircle (– 1, j 0) point in clockwise direction once

(b) Have anti-clockwise encirclement of the (– 1, j 0) point once

(c) Encircle (– 1, j 0) point as many times in the counter clockwise direction as the number of LHP poles of the closed loop transfer function

(d) Not encircle (–1, j 0) point at all

34. Nyquist plot can be used

(a) Only to find the closed loop poles in the right half plane

(b) Ascertain the stability only

(c) To find the open-loop poles in the right half plane

(d) To find the number of closed-loop poles in left half plane

35. State variable analysis is a

(a) Time domain approach

(b) Frequency domain approach

(c) Systematic approach

(d) Systematic frequency domain approach

36. In transient circuit analysis the order of the differential equation obtained for a series RLC network is

(a) 1st order

(b) 2nd order

(c) 3rd order

(d) 0th order

37. Final value theorem is valid for a transfer function F(s) only if

(a) Poles of F(s) lie in left-half plane

(b) Poles and Zeros of sF(s) lie in left-half plane

(c) Poles and Zeros of sF(s) lie in right-half plane

(d) Zeros of F(s) lie in left-half plane

38. The system with transfer function $\frac{K}{s^2(1+sT)}$ is operated in closed-loop with unity feedback. The closed-loop system is

(a) Stable

(b) Unstable

(c) Marginally Stable

(d) Conditionally Stable

39. A system has the transfer function $(1-s)/(1+s)$. It is a

(a) Non-minimum phase system

(b) Minimum-phase system

(c) Low-pass system

(d) Second-order system

40. The transfer function of a first order low pass filter having a resistor R and capacitor C is

(a) $\frac{R}{1+RCs}$

(b) $\frac{Cs}{s+RC}$

(c) $\frac{1}{1-RCs}$

(d) $\frac{\left(\frac{1}{RC}\right)}{\left(s+\frac{1}{RC}\right)}$

41. The transfer function is defined as

(a) The ratio of Laplace transform of output to Laplace transform of input considering initial condition as zero

(b) The ratio of Laplace transform of input to Laplace transform of output considering initial condition as zero

(c) The ratio of input to output

(d) The ratio of output to input

42. Without affecting steady state error the maximum over shoot can be decreased by incorporating

(a) Derivative error control

(b) Integral error control

(c) Gain adjustment

(d) Proportional error control

43. Derivative feedback control

(a) Increases rise time

(b) Increases over shoot

(c) Decreases steady state error

(d) Does not affect the steady state error

44. The generator constant K_g for a generator driven at 1000 RPM is 50 V/A; if the generator is made to run at 1500 RPM the new value of generator constant will be

(a) 75 V/A

(b) 33 1/2 V/A

(c) 150 V/A

(d) 100 V/A

45. The mutual inductance between two unity coupled coils of 9H and 4H is

(a) 36 H

(b) 13 H

(c) 2.2 H

(d) 6 H

46. If a 10 turn coil has a second layer of 10 turns wound over the first, then total inductance will be about ..... the original inductance

(a) 2 times

(b) 4 times

(c) 6 times

(d) 3 times

47. Three unequal impedances are connected in star on a three phase three wire system, the sum of three line currents will be

(a) three times the value of each current

(b) equal to each line current

(c) zero

(d) none of the above

48. Three equal resistances are connected in delta. If this delta is converted into star

(a) the resistance of the star network will be lower than the resistance of delta network

(b) the resistance of both networks will be equal

(c) the resistance of the star network will be larger than the resistance of delta network

(d) the resistance of the star network will be zero

49. A coil with an inductance 200μH of and a resistance of 5Ω are connected in series with a capacitor to form a series resonant circuit at 500 kHz. The value of capacitance is

(a) 520 μF

(b) 522 μF

(c) 507 μF

(d) 500 μF

50. A very high Q-factor for a series resonant circuit means that

(a) The capacitance in circuit is of high value

(b) The circuit has voltage magnification

(c) The circuit not only has high voltage magnification but also good selectivity

(d) The resistance of circuit is of high value

51. Transient currents are associated with the

(a) Changes in the stored energy in inductors and capacitors

(b) Resistance of the circuit

(c) Voltage applied to the circuit

(d) Impedance of the circuit

52. Unit impulse response of a system in Laplace transform gives

(a) Transfer function

(b) System gain

(c) Unit step function

(d) Unit ramp function

53. The convolution in time domain is equivalently represented in the frequency domain as

(a) Addition by s

(b) Division by s

(c) Summation

(d) Multiplication

54. Laplace transform is applicable for

(a) Linear time invariant (LTI) systems

(b) Stable systems

(c) Unstable and stable LTI Systems

(d) Any continuous system

55. Norton's theorem reduces a circuit to

(a) A voltage source

(b) A voltage source with an impedance in parallel

(c) A current source with finite impedance in series

(d) A current source with finite impedance in parallel

56. Superposition theorem is applicable to

(a) All electrical circuits

(b) Only circuits with RLC components and an energy source

(c) Electrical circuits involving only active and passive components

(d) Only for a linear circuit

57. An RC series circuit is fed by a DC source. The current in the circuit is maximum at

(a) $t = 0$

(b) t = infinite

(c) $t = RC$

(d) $t = 1/RC$

58. Three parallel circuits take the following currents: $i_1 = 5\sin 314t$, $i_2 = 30\sin(314t + \pi/2)$ and $i_3 = 25\sin(314t - \pi/2)$. The expression for resultant current is

(a) $25 \sin (314t + \pi/3)$

(b) $5 \sin (314t + \pi/2)$

(c) $10 \sin (314t - \pi/6)$

(d) $5\sqrt{2} \sin (314t + \pi/4)$

59. If the energy supplied by the car battery is increased by 20% and the voltage is decreased by 10% then the resulting charge has

(a) Decreased by 5%

(b) Increased by 1%

(c) Not changed

(d) Increased by 1.3%

60. A car battery has an energy of 2.4×10^6 joules. The battery can store the charge of 4×10^5 coulomb. The emf of the battery is

(a) 0.16 V

(b) 16 V

(c) 6 mv

(d) 6 V

61. A separately excited DC motor designed for operation on phase controlled converter has laminated interpoles

(a) To improve the commutation of the motor

(b) To facilitate easy construction

(c) To decrease the losses in the interpole

(d) To improve the power factor

62. The rotor of a six pole, slip ring induction motor has a resistance of 0.2Ω /phase and runs at 960 rpm on full load. When the load torque is held constant, the value of rotor resistance per phase to be inserted in the rotor circuit, when the machine runs at 800 rpm is

(a) 1 Ω

(b) 0.8 Ω

(c) 1.2 Ω

(d) 0.6 Ω

63. The motor having slip energy recovery scheme can be braked by means of

(a) Regenerative braking

(b) Plugging

(c) DC dynamic braking

(d) All the methods of (a), (b) and (c)

64. A three phase induction motor with chopper control resistance has its torque proportional to

(a) Rotor current

(b) Square of rotor current

(c) Stator resistance

(d) Square root of rotor current

65. A single phase bridge inverter delivers power to series connected RLC load with R = 2Ω, ωL = 8Ω; for the inverter - load combination, load commutation is possible in case the magnitude of $\frac{1}{\omega C}$ in ohms is

(a) 10

(b) 8

(c) 6

(d) zero

66. A single phase full bridge inverter can operate in load commutation mode in case, load consists of

(a) RL

(b) RL under damped

(c) RLC over damped

(d) RLC critically damped

67. The 3 phase ac to dc converter which requires neutral point connection is

(a) 3 phase semi converter

(b) 3 phase full converter

(c) 3 phase half wave converter

(d) 3 phase full wave converter with diodes

68. In controlled rectifier, the nature of load current (i.e) whether the load current is continuous or discontinuous

(a) Does not depend on type of load and firing angle delay

(b) Depends both on the type of load and firing angle delay

(c) Depends only on the type of load

(d) Depends only on the firing angle delay

69. In a 3 phase full converter, if the load current is I and ripple free, then the average thyristor current is

(a) $\frac{1}{2}$ I

(b) $\frac{1}{3}$ I

(c) $\frac{1}{4}$ I

(d) I

70. In a three phase semi converter, for firing angle equal to 120° and extinction angle equal to 110°, free wheeling diode conducts for

(a) 10°

(b) 30°

(c) 50°

(d) 110°

71. An overhead line with series compensation is protected using

(a) Impedance relay

(b) Reactance relay

(c) Mho relay

(d) None of the above

72. The current chopping tendency is minimised by using SF_6 gas at relatively

(a) High pressure and low velocity

(b) High pressure and high velocity

(c) Low pressure and low velocity

(d) Low pressure and high velocity

73. Mho relay is normally used for the protection of

(a) Long transmission lines

(b) Medium length lines

(c) Short length lines

(d) No length criterion

74. The rotation of disc of an induction disc relay under the poles is

(a) From unshaded pole to shaded pole

(b) From shaded pole to unshaded pole

(c) It depends upon the magnitude of current

(d) It depends upon the CT secondary connection

75. Linear Couplers are used for providing protection to

(a) EHV lines operating at 750 kV dc

(b) EHV lines operating at 750 kV ac

(c) EHV transformers

(d) EHV bus bars

76. Surge diverters are

(a) Non-linear resistors in series with spark gaps acting as fast switches

(b) Arc quenching devices

(c) Shunt reactors to limit the voltage rise due to Ferranti effect

(d) Shunt reactors to limit the over voltages of power frequency harmonics

77. Impulse testing of transformer is done to determine the ability of

(a) Bushing to withstand the vibrations

(b) Insulation to withstand transient voltages

(c) Winding to withstand voltage fluctuations

(d) All the above

78. If inductance and capacitance of a system are 1 H and 0.01 μF respectively and the instantaneous value of current interrupted is 10 amps, the value of shunt resistances across the breaker for critical damping is

(a) 100 KΩ

(b) 10 KΩ

(c) 5 KΩ

(d) 1 KΩ

79. Corona loss increases with

(a) Increase in supply frequency and conductor size

(b) Increase in supply frequency but reduction in conductor size

(c) Decrease in supply frequency and conductor size

(d) Decrease in supply frequency but increase in conductor size

80. The chances of arc interruption in subsequent current zero

(a) Increases in case of OCB

(b) Decreases in case of OCB

(c) Interruption is always at first current zero (in OC(B)

(d) None of the above

81. Shunt compensation in an EHV line is resorted to

(a) Improve the stability

(b) Reduce the fault level

(c) Improve the voltage profile

(d) As a substitute for synchronous phase modifier

82. The inertia constant of two groups of machines which do not swing together are M1 and M2 such that M1 > M2. It is proposed to add some inertia to one of the two groups of machines for improving transient stability of the system. It should be added to

(a) M1

(b) M2

(c) It does not matter whether to add to M1 or M2

(d) None of the above is true

83. Which type of insulators are used in 132 KV transmission line

(a) Pin type

(b) Disc type

(c) Shackle type

(d) Pin & shackle type

84. Shunt capacitance is usually neglected in the analysis of

(a) Short transmission line

(b) Medium transmission line

(c) Long transmission line

(d) Medium as well as long transmission lines

85. Corona usually occurs when the electrostatic stress in the air exceeds

(a) 30 KV (maximum value)/cm

(b) 22 KV (maximum value)/cm

(c) 11 KV (rms value)/cm

(d) 6.6 KV (rms value)/cm

86. For transmission line the standing wave ratio is the ratio of

(a) Maximum voltage to minimum voltage

(b) Maximum current to minimum voltage

(c) Peak voltage to rms voltage

(d) Maximum reactance to minimum reactance

87. The direction of rotation of an ordinary shaded pole single-phase induction motor

(a) Can be reversed by reversing the supply terminal connections to the stator winding

(b) Cannot be reversed

(c) Can be reversed by open-circuiting the shaded rings

(d) Can be reversed by short-circuiting the shaded rings

88. When a single phase supply is connected across a single-phase winding, the nature of the magnetic field produced is

(a) Pulsating in nature

(b) Rotating in nature

(c) Constant in magnitude but rotating at synchronous speed

(d) Constant in magnitude and direction

89. Synchronous motors are to be used in situation where

(a) The load is constant

(b) The load is required to be driven at very high speeds

(c) The load is to be driven at constant speed

(d) The starting torque requirement of the load is very high

90. Pitch factor for 5/6 short pitch coil is

(a) 0.966

(b) 0.833

(c) 1.0

(d) 3.454

91. The magnitude of the resultant magnetic field produced by a three-phase current flowing through a three-phase winding is equal to

(a) The maximum value of flux due to any one phase

(b) 1.5 times the maximum value of flux due to any one phase

(c) Half the value of maximum flux due to any one phase

(d) Twice the maximum value of flux due to any one phase

92. In alternators damper windings are used to

(a) Reduce eddy current loss

(b) Prevent hunting

(c) Make the rotor dynamically balanced

(d) Reduce armature reaction

93. When the rotor circuit resistance of a polyphase induction motor is increased

(a) The starting torque increases

(b) The maximum value of torque decreases

(c) The slip at which maximum torque occurs remains unchanged

(d) Maximum torque is developed at starting

94. In the equivalent circuit of a three phase induction motor the mechanical load on the motor can be represented by a resistance of value

(a) R_2

(b) R_2 / s

(c) $R_2 \frac{(1-s)}{s}$

(d) $\frac{R^2}{s} + 1$

95. The power input in no-load test performed on a three phase induction motor is approximately equal to

(a) Hysteresis loss in the core

(b) I^2R loss in the winding

(c) Eddy-current loss in the core

(d) Iron-loss in the core

96. A delta-connected 400 V, 50 Hz, three phase induction motor when started direct-on-line takes a starting current of 30 A. When the motor is started through a star-delta starter, the starting current will be

(a) 3 A

(b) 10 A

(c) 15 A

(d) 30 A

97. For a three phase induction motor having rotor circuit resistance of 6Ω, maximum torque occurs at a slip of 0.6. The value of standstill rotor circuit reactance is

(a) 4.44 Ω

(b) 0.36 Ω

(c) 1 Ω

(d) 10 Ω

98. Torque developed by a three phase, 400 V induction motor is 100 N-m. If the applied voltage is reduced to 200 V, the developed torque will be

(a) 50 N-m

(b) 25 N-m

(c) 200 N-m

(d) 62.5 N-m

99. A 400V, 50Hz three-phase induction motor rotates at 1440 rpm on full load. The motor is wound for

(a) 2 poles

(b) 4 poles

(c) 6 poles

(d) 8 poles

100. An additional condition for parallel operation of three phase transformers over single phase transformers is that

(a) The transformers should belong to the same vector group

(b) Ratios of the winding resistances to resistances for the transformers should be equal

(c) The transformers should have the same kVA ratings

(d) The transformers should not be belong to the same vector group

101. The ratio of the primary to secondary voltage of a transformer is 2:1. The saving in terms of weight of copper required if an autotransformer is used instead of a two-winding transformer will be

(a) 50%

(b) 33.33%

(c) 66.67%

(d) 97%

102. The all-day efficiency of the transformer is the ratio of

(a) kWh input and kWh output per day

(b) kWh output and kWh input in a day

(c) Output power and input power

(d) Input power and output power

103. Maximum efficiency of a transformer occurs when

(a) Hysteresis loss and eddy current loss are minimum

(b) The sum of hysteresis loss and eddy current loss is equal to copper loss in the windings

(c) Power factor of the load is leading

(d) Hysteresis loss is equal to eddy current loss

104. Power lost in the open-circuit and short circuit tests on a transformer gives approximately an account of the following losses

(a) Core losses and copper losses respectively

(b) Copper losses and core losses respectively

(c) Eddy current loss and Hysteresis loss respectively

(d) Hysteresis loss and eddy current loss respectively

105. The emf induced in the secondary winding of a 50Hz single-phase transformer having 1000 turns on its secondary is 222V. The maximum flux density in the core is 0.1 Wb/m^2. The cross-sectional area of the core is

(a) $0.1\,m^2$

(b) $0.01\,m^2$

(c) $1\,m^2$

(d) $0.001\,m^2$

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

(a) At no-load it will rotate at a dangerously high speed

(b) At no-load it will not develop high starting torque

(c) It cannot start without load

(d) It draws a small amount of current at no-load

107. Swinburne's method cannot be used for determining the efficiency of a dc series motor because

(a) It is not advisable to run a series motor on no-load

(b) A series motor takes excessive current at no-load

(c) A series motor develops very high starting torque

(d) It is not possible to load a series motor in steps

108. The direction of rotation of a separately excited dc motor can be reversed

(a) By reversing the connections of both armature and the field windings with the supply

(b) By reversing the connections of either the armature or the field winding with the supply

(c) By reducing the field flux

(d) By introducing an extra resistance in the armature circuit

109. The induced emf in the armature of a lap-wound four pole dc machine having 100 armature conductors rotating at 600 rpm and with 1 Wb flux per pole is

(a) 1,000V

(b) 100V

(c) 600V

(d) 10,000V

110. In a dc machine, interpoles are used to

(a) Neutralise the effect of armature reaction in the interpolar region

(b) Generate more induced emf in the armature

(c) Avoid interference of the armature flux with the main- field flux

(d) Reduce the demagnetising effect of armature reaction

111. The armature of a dc machine is made up of laminated sheets to

(a) Reduce Hysteresis loss

(b) Reduce eddy-current loss

(c) Reduce armature copper loss

(d) Increase dissipation of heat from the armature surface

112. The modulating frequency in frequency modulation is increased from 10 kHz to 20 kHz. The bandwidth is

(a) Doubled

(b) Halved

(c) Increases by 20 kHz

(d) Increases tremendously

113. The main advantage of PCM is

(a) Less band width

(b) Less power

(c) Better S/N ratio

(d) Possibility of multiplexing

114. The positive RF peaks of an AM voltage rise to a maximum value 12 V and a drop to minimum value of 4V. The modulation index assuming single tone modulation is

(a) 3

(b) 1/3

(c) 1/4

(d) 1/2

115. Assuming other parameters unchanged, if the modulating frequency is halved in a modulating systems, the modulation index is doubled. The modulation system is

(a) AM

(b) FM

(c) Phase modulation

(d) Angle modulation

116. A plot of modulation index verses carrier amplitude yields a

(a) Horizontal line

(b) Vertical line

(c) Parabola

(d) Hyperbola

117. Commonly used ICs are

(a) Thin film

(b) Monolithic

(c) Photographite

(d) Hybrid

118. The type of multivibrator used for generation of clock pulses is

(a) Monostable multivibrator

(b) Astable multivibrator

(c) Bistable multivibrator

(d) None of the above

119. The essential requirements of a sawtooth wave generator, in addition to a DC power source, are

(a) A switching device

(b) A resistor

(c) A capacitor

(d) All of the above

120. Which one of the following oscillator is used for generation of high frequencies

(a) R-C phase shift

(b) Wien bridge

(c) L-C oscillator

(d) Blocking oscillator