Test for recruitment for the post Graduate Engineer Trainee
Maximum marks: 120 **Time: 3Hrs**

Of the four alternatives given in question find the one that best fits into the blank space (questions 1 to 3)

1. In high school many of us never realized the importance that grammar would _____ in later life.
A) exercise B) figure C) portray D) play*

2. The miser gazed _____ at the pile of gold coins in front of him.
A) avidly* B) earnestly C) thoughtfully D) admiringly

3. There was no _____ in the railway compartment for additional passengers.
A) space B) place C) room* D) seat

4. Find the common countable compound noun
A) Human rights B) arms race C) old age D) news bulletin*

5. Find the common plural compound noun
A) Natural resources* B) Solar system
C) Income tax D) Health centre

Find the meaning of (questions 6 to 10):
6. Candid
A) to say openly and honestly* B) cunning
C) hungry D) a substance that promotes an activity

7. Bigot
A) A person having strong belief on ghost
B) A person having strong belief on God
C) A person having strong belief about race*
D) A person indifferent to pleasure or pain

Write the opposite meaning of (questions 8 to 10)
8. Salubrious
A) beneficial B) healthy C) unhealthy* D) statutory

9. Shrewd
A) cleaver B) discerning C) wise D) stupid *

10. Tact
A) indiscretion* B) subtlety C) skill D) prudence

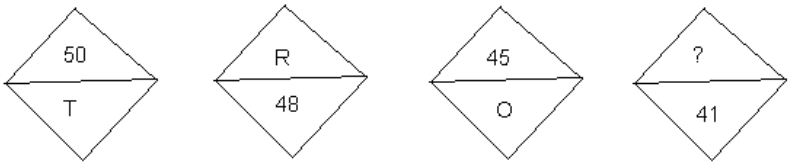
11. In a certain code 'CODE' is written as 'abld', 'EAT' as 'lpc', 'DARK' as 'bpn' then find which is coded by 'p' ?
A) O B) A* C) D D) R

12. In a certain code 'GREY' is written as 'TIVB' , 'IRAQ' as 'RIZJ' , then what will be the code of 'WHAT'?
A) DSZG * B) GHTP C) IOLK D) BDTN

13. In the following series , what will be the value of ?
A * 1 B # 3 C @ 5 D ^ ?
A) 8 B) E C) 7* D) &

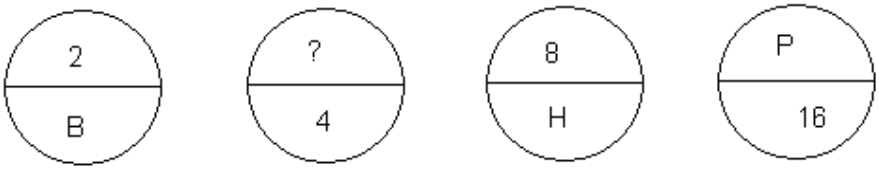
Find the missing character in place of "?" (questions 14 & 15)

14.



A) K * B) P C) Q D) F

15.



A) A B) C C) D* D) F

16. If iron is called as grinder, grinder is called calculator, calculator as oven , oven as radio then in what will a cook will bake ?

A) calculator B) iron C) oven D) radio*

17. Arrange the words in alphabetic order

(a)Gesture, (b)Gentle, (c)Genuine, (d) Gourd

A) a➔b➔c➔d B) b➔c➔a➔d * C) a➔c➔d➔b D) c➔d➔a➔b

In each of the four groups of letters one is different. Find the odd one out (questions 18 to 20)

18. IJkl ,mnOP ,qrST ,uvWX

A) uvWX B) qrST C) mnOP D) IJkl *

19. NMRQ ,BAFE ,GHJI ,VUWX

A) NMRQ B) BAFE C) GHJI * D) VUWX

20. bC gF jK ,mN rQ uV ,aB dC gH , kL pO sT

A) aB dC gH * B) mN rQ uV C) bC gF jK D) kL pO sT

21. Taxol is a

A) an analgesic B) a potent antimalarial agent

C) Wonder for Parkinson's disease D) a potent anticancer agent*

22. The words 'socialists secular' and 'the unity and integrity of the nation' were added to the Indian Constitution by the _____ Amendment.

A) 42nd * B) 44th C) 52nd D) none of the mentioned

23. The bowler with most wicket in IPL 2008

A) P. Chawla B) Sree Santh C) S. Warne D) S. Tanvir*

24.The first state to have prepared its Human Development Report and released by Amartya Sen

A) West Bengal B) Kerala C) Andhra Pradesh* D) Delhi

25. Who said?
'Every human being- man woman is born equal, and he or she shall have equal opportunities of development- that should be our dictum.'

A) Netaji Subhas Chandra Bose* B) Swami Vivekananda
C) Rishi Aravindo D) Mahatma Gandhi

26. Right to Information Act came into force on
A) 12 October 2001 B) 12 October 2005*
C) 1 January 1957 D) none of the mentioned

27. The minimum distance between the sum and the earth occurs on
B) December 24 B) June 21 C) September 22 D) January 3*

28. Where is a significant concentration of Christians found in India?
A) Sikkim B) Arunachal Pradesh C) Manipur D) Nagaland*

29. Which one of the following Prime Ministers never attended the Parliament during his tenure
A) Atal Behari Vajpayee B) Chandra Shekhar C) VP Singh D) Choudhary Charan Singh*

30. Urea in human body is synthesized by
A) Liver* B) Kidney C) Lungs D) Spleen

31. If $7^{x+1} - 7^{x-1} = 48$, find the value of x :
A) 3 B) 4 C) 2 D) 1 *

32. The solution set of the equation $x^{2/3} + x^{1/3} = 2$ is:
A) {-8,1} B) {8,1} * C) {1,-1} D) { 2,-2}

33. If $kx3 + 9x^2 - 10$ divided by x+3 leaves a remainder 5 , then the value of k will be :
A) 1 B) 2 * C) -2 D) -1

34. Divide 243 in three equal parts such that half of the first part , one-third part of the second part and one-fourth of the third part , shall be equal ?
A) 48, 63, 132 B) 62, 84, 96 C) 44, 90, 66 D) 54 , 81 , 108 *

35. Find the largest angle of the triangle whose sides are 7 cm, 5 cm and 3 cm?
A) 45^0 B) 60^0 C) 120^0 * D) Data insufficient

36. In a race of 500 meters, the ratio of speeds of X and Z is 3 : 4 , X has a start of 140 meters , then
A) Z wins by 200 meters B) X wins by 20 meters *
C) Z wins by 40 meters D) X wins by 40 meters

37. A sum of money at compound interest amounts to thrice itself in 3 years . In how many years will it be nine times itself ?
A) 18 B) 21 C) 6 * D) 9

38. How much % must be added to the cost price of goods so that a profit of 20 % must be made after throwing off a discount of 10 % from the marked price ?
A) 20 B) 45 C) 35 D) 100/3 *

39. $\cos 1^0 \cos 2^0 \cos 3^0 \ldots\ldots\ldots\ldots\ldots\cos 179^0$ is equal to :
A) -1 B) 0* C) 1 D) $1/\sqrt{2}$

40. The value of $\sqrt{\frac{1 + \sin Z}{1 - \sin Z}}$ is equal to :

A) sec Z + tan Z* B) cosec Z +cot Z C) tan Z+ cot Z D) sec Z+ cosec Z

41. Determine the total inductance of a parallel combination of 100mH, 50mH and 10mH

* A) 7.69mH B) 160mH C) 60mH D) 110mH

42. If one of the resistors in a parallel circuit is removed, what happens to the total resistance?

A) Decreases * B) Increases

C) Exactly doubles D) Remains constant

43. Six light bulbs are connected in parallel across 110V. Each bulb is rated at 75 W. How much current flows through each bulb?

* A) 0.682 A B) 0.7 A C) 75 A D) 110 A

44. A practical voltage source consists of an ideal voltage source in

* A) Series with an internal resistance

B) Parallel with an internal resistance

C) Both (A) & (B)

D) None of the above

45. A coil of 400 turns has a flux of 0.5 mWb link with it when carrying a current of 2A. What is the value of inductance of the coil?

A) 100 H B) 10 H C) 0.001H * D) 0.1 H

46. The area of the face of the pole is 1.5m² and the total flux is 0.18 Webers. The flux density in the air gap

* A) 0.12 tesla B) 120 tesla C) 1.2 tesla D) 1.2 x 10^{-2} tesla

47. The reciprocity theorem is applicable to

A) Linear networks only B) Bilateral networks only

* C) Both (A) and (B) D) None of these

48. The algebraic sum of all the currents meeting a junction is equal to

A) 1 B) -1 * C) Zero D) Can't be predicted

49. The permeability of all non-magnetic materials including air is

A) $2\pi \times 10^{-}$ □ H m * B) $4\pi \times 10^{-}$ □ H m

C) $\pi \times 10^{-}$ □ H m D) $6\pi \times 10^{-}$ □ H m

50. Plugging of a dc motor is normally executed by

A) Reversing the field polarity

* B) Reversing the armature polarity

C) Reversing both armature and field polarity

D) Connecting a resistance across the armature

51. With given power rating for lower current and higher voltage rating of a dc machine, one should prefer

* A) Wave winding B) Lap winding

D) Duplex winding D) all of the mentioned

52. Two sinusoidal currents are given by $i_1 = 10 \sin(wt + \pi/3)$ $i_2 = 15 \sin(wt - \pi/4)$. Phase difference between them is

A) 150°

B) 50°

C) 105°

* D) 60°

53. Which type of compounding would be desirable in a dc generator feeding a long transmission line?

*(A) Over compounding B) Flat compounding

C) Under compounding D) None of the above

54. While pole flux remains constant if the speed of the generator is doubled the e. m. f generated will be

* A) Twice B) Half

C) Normal value D) Slightly less than nominal

55. The function of the brushes and the commutator in a dc motor is to

A) Reduce sparking

* B) Produce unidirectional torque

C) Help in changing the direction of rotation of armature

D) Produce unidirectional armature current

56. In a transformer the flux phasor

* A) Leads the induced emf by 90º

B) Lags the induced emf by 90º

C) Leads the induced emf by slightly les than 90º

D) Lags the induced emf by slightly les than 90º

57. A single phase transformer when supplied from 220 V, 50 Hz has eddy current loss of 50 W. If the transformer is connected to a voltage of 330 V, 50 Hz the eddy current loss will be

A) 168.75 W B) 112.5 W C) 75 W *D) 50 W

58. A 2 / 1 ratio, two winding transformer is connected as an auto transformer. Its KVA rating as an auto transformer compared to a two – winding transformer is

* A) 3 times B) 2 times C) Same D) 1. 5 times

59. The colour of fresh dielectric oil for a transformer is

A) Gray B) Dark brown * C) Pale yellow D) Colourless

60. The horsepower rating of a motor having an efficiency 0f 75% to run a generator supplying 18.65A at 300V is

A) 7.5 B) 10 * C) 12 D) 15

61. The electric field at a point situated 4 m away from a point charge is 200N/C. If the distance is reduced to 2 m the field intensity will be

A) 44 N/C B) 600 N/C C) 800 N/C * D) 1200 N/C

62. The reluctance of air gap as compared to iron path will be

A) Lower B) higher * C) equal D) none of the above

63. Laminated cores in electrical machines are used to reduce
A) hysteresis loss B) eddy current loss * C) copper loss D) none of the above

64. The energy stored in a coil of inductance 0.15 Henry carrying a current of 180mA is
A)2.43 J B) 2.43 X 10-3 J * C) 2.43 X 10-6 D) none of the above

65. If a conductor of length l is moving in a magnetic field having a flux density B with a velocity v then the magnitude of the induced emf is given by Blv provided
A) the direction of B is parallel to the direction of l
B) the direction of the velocity is parallel to the direction of B
C) the direction of B, l and v are mutually perpendicular *
D) none of the above

66. If R_2 is the resistance of the secondary winding of a transformer and K is the transformation ratio the equivalent secondary resistance referred to primary will be
A)$R_2/\sqrt{K}$ B) R_2/K C) R_2/K^2 * D) none of the above

67. A three phase 440 V 50 Hz induction motor is running with a slip of 4% The frequency of the rotor current will be
A)200 Hz B) 100 Hz C) 2 Hz * D) 1 Hz

68. The phenomenon of rise in voltage at the receiving end of a lightly loaded transmission line is called
A) Seeback effect B) Raman effect C) Ferranti effect * D)Skin effect

69. A dummy gauge is used in strain gauge bridge to
A) improve linearity
B) improve stability
C) provide temperature compensation *
D) none of the above

70. In a circuit breaker the basic aim is to
A) maintain the arc B) to extinguish the arc *
C) transmit large power D) none of the above

71. An ideal generator should have a voltage regulation of
A) 100% B) 10% C) 0% * D) 50%

72. In induction motors air gap is kept as small as possible in order to have
A)low power factor B) high power factor*
C) high starting torque D) none of the above

73. At radio frequencies, the iron core material of inductors
A) Has a low permeability B) Is laminated
* C) Is called ferrite D) Reduces inductance as well as losses

74. A conductor of 0.2 m long carries a current of 3 A. at right angle to a magnetic field of 0.5 tesla. The force acting on the conductor will be
A) 30 N B) 3.0 N C) 1.0 N * D) 0.3 N

75. For 4 % drop in supply voltage the torque if an induction motor decreased by
A) 4 % B) 8 % * C) 16 % D) 2 %

76. The double cage rotors are used to
* A) increase pull out torque B) increasing starting torque
C) improve efficiency D) reduce rotor core losses

77. In dynamic breaking

A) Any two stator terminals are earthed

B) A dc voltage is injected in the rotor circuit

* C) Stator terminals are switched over to a dc source from the ac supply

D) The supply terminals of any two stator phases are interchanged

78. A synchronous induction motor

A) Has combined characteristics of synchronous motor and induction motor at starting

B) Starts at synchronous motor but runs as an induction motor

* C) Starts at an induction motor but runs as a synchronous motor

D) None of the above

79. The total number of slots on the stator of a 3 – ø, 6 poles induction motor having 3 slots per pole per phase is

A) 18 * B) 54 C) 9 D) 27

80. The back e.m.f. set up in the armature of a synchronous motor depends on

A) Rotor speed only

* B) Rotor excitation only

C) Rotor excitation and rotor speed

D) Coupling angle, rotor speed and excitation

81. Hunting in a synchronies motor is due to

A) Variable frequency B) Variable supply voltage

* C) Windage friction D) Variable load

82. A synchronous motor is said to be 'floating' when it operates

A) On pulsating load

* B) On no load and without losses

C) On constant varying load

D) On high load and varying supply voltage

83. If the excitation current of synchronous motor be increased, the p. f. of the motor will

* A) Improve B) Decreases

C) Remain constant D) Depends on the other factor

84. A photocell is illuminated by a small bright source placed 1 m away. When the same source of light is placed 2 m away, the electrons emitted by the photo cathode

A) Each carries 1 quarter of their previous energy

B) Each carries 1 quarter of their previous moments

C) Are half of numerous

*D) Are 1 quarter as numerous

85. A certain amount of diode current still flows when diode is under reverse bias condition, what is this current called ?

A) Reverse bias current * B) Reverse saturation current

C) Reverse diode current D) Diode off current

86. Modulation is a process to carry
* A) Carrier signal by the signal to be transmitted
B) Signal to be transmitted
C) All of the above
D) None of the above

87. Crystal oscillator is used because
A) Its give higher output voltage
B) It has high efficiency
* C) The frequency of oscillations remains substantially constant
D) It requires very low dc supply voltage

88. The input impedance of the operational amplifier is
A) Infinite B) Zero *C) Very high but not infinite D) Very small

89. In CRT Aquadag carries
* A) Aqueous solution of graphite B) Sweep voltage
C) Secondary emission electrons D) None of the above

90. For phase fault the relay used is
* A) distance relay B) thermal relay
C) over-current relay D) induction relay

91. Coupling capacitors used in carrier protection have values usually in the range of
A) 1 to 20 μF B) 100 to 500 μF
C) 0.01 to 0.1 μF *D) 1000 to 5000 μF

92. The shunt compensation in an EHV line is used to
A) improve stability B) reduce fault level
* C) improve voltage profile D) substitute for synchronous phase modifier

93. For which of the following sinusoids, the rms value and mean value is the same
A) Sine wave B) Triangular wave
* C) Square wave D) Half wave rectified sine wave

94. In a parallel RC circuit, the supply current always ------ the applied voltage
A) lags B) leads * C) remains on phase with D) none of the mentioned

95. A 75 MVA, 10 kV synchronous generator has $X_d = 0.4$ pu. The X_q value (in pu) to a base of 100 MVA, 11 kV is
A) 0.578 B) 0.279 C) 0.412 * D) 0.44

96. Summation transformers are used in
A) carrier relays B) distance relays * C) pilot wire relays D) earth fault relays

97. Grounding transformer in a system is usually connected in
A) delta/delta * B) star/delta C) zig-zag/delta D) star/star

98. For the characteristic equation $s^2 + 4.8s + 72 = 0$, the damping ratio and natural frequency respectively are
A) 0.212 and 8.1 rad/s * B) 0.283 and 8.48 rad/s
C) 0.299 and 8.66 rad/s D) none of these

99. The type-0 system has a finite non-zero value of
*A) K_p B) K_v C) K_a D) either of these

100. The transfer function of an integral controller is of the type
A) K_c B) Ts * C) $\frac{1}{Ts}$ D) $\frac{1}{Ts+1}$

101. The transfer function $\frac{1}{(jwT)}$ has a slope of
* A) -20 dB/decade B) +20 dB/decade
C) 6 dB/decade D) -6 dB/decade

102. If the system has multiple poles on the *jw* axis, the system is
A) stable B) conditionally stable
C) marginally stable * D) unstable

103. In AM transmission the frequency which is not transmitted is
A) upper side frequency B) lower side frequency
* C) audio frequency D) carrier frequency

104. To generate PCM the signal sampled and converted into
A) PWM B) PPM * C) PAM D) PDM

105. In synthetic fiber mills, motor with
* A) constant speed is preferred
B) high starting torque is preferred
C) variable speed is preferred
D) low starting torque is preferred

106. Power supply frequency for 25 kV single phase system fed to trains is
* A) 50/3 Hz B) 25 Hz C) 50 Hz D) 60 Hz

107. A forward voltage can be applied to an SCR after its
A) anode current reduces to zero * B) gate recovery time
C) reverse recovery time D) anode voltage reduces to zero

108. Each diode of a 3-phase, 6-pulse bridge diode rectifier conducts for
A) 60° * B) 120° C) 180 ° D) 90°

109. Triac is equivalent to
A) two SCRs connected in parallel
B) two SCRs connected in antiparallel
C) one SCR and one diode connected in parallel
D) none of these

110. A thyristor can be termed as
* A) DC switch B) AC switch C) square wave switch D) none

111. The number of comparator circuits required to built a 3-bit simultaneous A/D converter is
A) 8 * B) 7 C) 15 D) 16

112. In an intrinsic semiconductor
A) there are no holes in the material
B) the number of holes is too small
C) electrons in the material are neutralized by holes
D) there are no electrons in the material

113. A circuit in which the output voltage remains constant irrespective of the value of the load resistance, uses
A) silicon diode * B) zener diode C) SCR D) none of these

114. The transfer function is $\frac{1+0.5s}{1+s}$. It represents a
A) lead network * B) lag network
C) lag-lead network D) proportional controller

115. The root loci of a system have three asymptotes. The system can have
A) three poles B) five poles and two zeros
C) four poles and one zero * D) all of these

116. The net magnetic moment is zero in case of a
(A) ferromagnetic materials
(B) ferro nonmagnetic materials
*(C) antiferromagnetic materials
(D) none of these

117. The donor atoms in an *N*-type semiconductor at normal temperature
A) carry a positive charge * B) carry a negative charge
C) are neutral D) none of these

118. The change of dimensions during the process of magnetization is called
A) skin effect B) Hall's effect * C) magnetostriction D) none of these

119. If in linear system an input of $5\sin\omega t$ produces an output of $10\cos\omega t$, the output corresponding to $15\sin\omega t$ will be equal to
A) $\frac{10}{3}\cos\omega t$ B) $30\sin\omega t$
* C) $30\cos\omega t$ D) none of these

120. The biasing that provides good stability of the operation point but fails to provide good amplification in a transistor is said to be
A) fixed bias * B) collector to base bias
C) self bias D) collector to emitter bias