Electrical

S.No.: 3698

National Power Training Institute E-A

(Under Ministry of Power, Govt. of India Organization)

Common Entrance Test (CET) for the admission to the PGDC Diploma in Thermal Power Plant Engineering at various Institutes of NPTI.

Date of Examination :- **20th June 2010** Duration of the Exam. **11 AM to 1.30 PM**

Entrance Test Details: Duration - **150 Minutes** Type - Objective **(180 Questions)**

The correct answer is to be chosen from the given four options i.e a,b,c, and d,

Part –I - General Aptitude (60 Questions)

Part – II - General Engineering (30 Questions)

Part – III – Main Engineering (90 Questions)

Group I – Mechanical , Mechanical and Automation , Production Engineering and Equivalent

Group II – Electrical , Electrical & Power ,Electrical & Electronics Engineering and Equivalent.

Group III – Electronics , Electronics & Communication ,Electronics & Telecommunication, Electronics & Instrumentation Engineering , Electronics & Control and Equivalent.

Markings: 2 (two) marks for every correct answer and negative 0.5 marks for every wrong answer.

Instructions to the Candidate

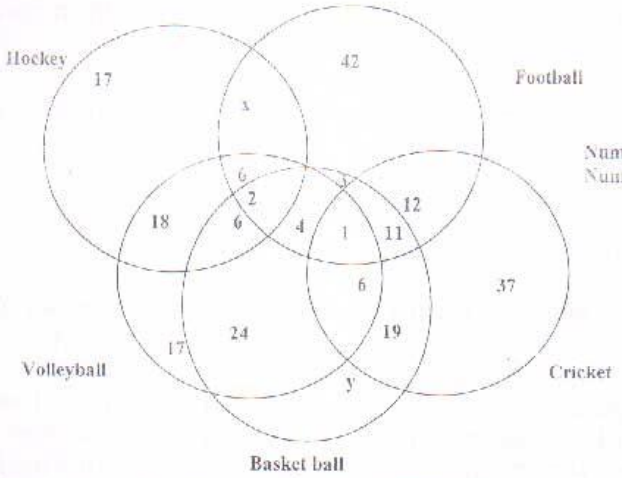
1) Do not open the staple of the questions booklet unless you are asked to do so.
2) Please mark the correct answer in the OMR sheet against the corresponding questions using Black/Blue ball point pen only. Calculations can be carried out on the Question booklet and not on OMR sheet.
3) Finalize your answer before entering in OMR . There is no scope for correction later on.
4) Negative marking is also done to avoid random marking. Each of the marked correct answer shall be rewarded two (2)marks and a wrong marking will be penalized by (-1/2) marks.
5) Possession of calculator , Mobile or any Electronic gadgets are not allowed . Possession of any such gadgets in the hall will result in debarring the candidate from examination.
6) Strict discipline shall be maintained at the time of written Examination.

Candidate's Name : _____

Roll No. : _____

Centre : _____

Direction (Q.No 8 to 12): In the following questions study the figure and answer the questions given belo



Number of students playing Hockey is 53
Number of students playing Basketball is 76

8. Which sport is played by maximum number of students?

(a) Hockey (b) Football (c) basketball (d) Cricket

9. The number of students who played at least three games?

(a) 36 (b) 32 (c) 37 (d) 33

10. How many students play volleyball, basketball or football?

(a) 181 (b) 171 (c) 167 (d) 175

11. How many students play hockey of football?

(a) 131 (b) 126 (c) 113 (d) 123

12. How many students play two games?

(a) 76 (b) 86 (c) 80 (d) 92

13. If $x = 4$, then the L.C.M. of $x^2 - 4$ and $x^2 - 5x + 6$ is

(a) 12 (b) 2 (c) 6 (d) 4

14. Observe the given sequence 11, 21, 31, 41, P. The value of $\frac{P - 90}{17}$ is

(a) 90 (b) 180 (c) 370 (d) None of these

PART – I (Questions 1 to 60)

General Aptitude

1) If the average of five numbers is -10 and the sum of three of the numbers is 16 . then what is the average of other two numbers ?
   a) -33 b) -1 c) 10 d)29

2) The average of 6 consecutive integer in increasing order of size is 9 ½ what is the average of last three integers
   a) 8 b) 9 ½ c) 10 d)11

3) x+2y-z = 1, 3x-2y-8z = -1

   In the systems of equations above if z is not zero then what is the ratio of x to z
   a) -9/4 b) -1/3 c) 1/3 d) 9/4

4) Ram starts jogging from point X to point Y .Half an hour later his friend Shyam who jogs 1 km/hr slower than twice Rams rate starts from the same point and follows the same path. If Shyam takes over Ram in 2 hours . How many kms will shyam have covered ?
   a) 1 1/5 b) 10/3 c) 4 d) 6

5) Two cars start at the same point and travel in opposite direction . If one car travels at 45 km/hr and other at 60 km /hr . How much time will pass before they are 210 km apart.
   a) 0.5 hrs b) 1 hr c) 1.5 hr d) 2 hrs

6) ½ of .2 percent equals
   a) 1 b) 0.1 c) 0.01 d) 0.001

7) If two numbers are in the ratio 3:5 . If 8 is added to each number the ratio becomes 2.3 . What are the numbers ?
   a)24 and 40 b) 20 and 30 c) 32 and 42 d) 54 and 64

15) The sides of a right triangle are a and b and the hypotenuse is c . A perpendicular from the vertex divides c into segments r and s, adjacent respectively to a and b . If a:b=1:3 then the ratio of r to s is

a) 1:3 b) 1:9 c)1:10 d)3:10

16) If the volume of a certain cube is equal to its surface area then what is the length of an edge of the cube

a) 6 b) 10 c) 18 d) 24

17) How many integers are there between 49 and 101 inclusive of both ?

a) '50 b) 51 c) 52 d) 53

18) If Tuesday falls on 12th July 1998 , what day will be on 12th July 1995?

a) Monday b) Wednesday c) Thursday d) None of these

19) If all the numbers from 1 to 73 which are divisible by 7 are arranged in descending order then which number will be at 8th and 5th places?

a)21,42 b)28,42 c)21,56 d) 14,49

Direction: In question 20 and 21 if the given interchanges are made between signs and numbers which one of the four equations would be correct

20) Given Interchanges

Sign '_ ' and '÷ 'and Numbers 4 and 8

a) 6-8 ÷4 = 1.0 b) 8-6 ÷4 = 1.0 c)4 ÷8 -2 = 6.0 d) 4-8 ÷6 = 2.0

21.) Given Interchanges :

Sign '_ ' and '×' and Numbers '3 ' and '6'

a) 6-3 ×2 =9 b) 3-6 × 8 = 10 c) 6 × 3 - 4 = 15 d) 3 × 6 – 4 = 33

22.) If TOUR is written in a certain code as 1234 , CLEAR as 56784 and SPARE as 90847. What will be the 5th digit for SCULPTURE in the same code ?

a) 3 b) 6 c) 0 d) 4

Direction :(Q.No. 23 to 27) Study the following information carefully, and answer the questions given below

Number Code:	0	1	2	3	4	5	6	7	8	9
Symbol Code:	α	β	γ	δ	£	η	π	φ	ξ	ψ

(i) If a number starts with an odd number then that odd number should be codified as #

(ii) If a number ends with an even number then that even number should be codified as *

(iii) Number 5 & 8 should be always coded as '@' and 'Δ' respectively whenever they are neither at the beginning nor at the end.

Excluding cases given at (i), (ii), and (iii) the n umbers should be codified as per letter codes given above.

23. Which of the following will be the code for 347081 92?

(a) δ £ φ α Δ β ψ (b) δ £ η φ α Δ γ (c) δ £ φ α Δ β ψ

(d) None of these

24. What will we get after decoding γ δ φ @Δ π *

(a) 2 3 7 5 8 6 4 (b) 2 3 7 5 8 6 6 (c) 2 3 7 5 8 6 2

(d) None of these

25. The code of 5186706 is same as the code of which number?

(a) 3 1 8 6 7 0 5 (b) 7 1 8 6 7 0 3 (c) 6 1 8 6 7 0 5

(d) None of these

26. Which of the following will be coded for 1586325?

(a) # £ φ α Δ β ψ (b) δ £ η φ α Δ γ (c) δ £ φ α Δ β ψ

(d) None of these

27. What will we get after decoding π α δ @ ψ δ β?

(a) 4 0 3 5 8 3 1 (b) 6 0 3 5 9 3 1 (c) Can't be determined

(d) None of these

28) What is a sixth term of the sequence 90 , -30, 10 , 10/3 , ...

a) 1/3 b) 0 c) -10/27 d) -3

29) If in a certain school 20 students are taking maths, 10 are taking history and 7 are taking both . How many students are taking either maths or history

a) 20 b) 22 c) 23 d) 25

30) India got independence on 15th August 1947. What was the day of the week?

(a) Friday (b) Tuesday (c) Wednesday (d) Sunday

31) 365 x 18.6 + 9880 / 38 +? = 8400

(a) 1351 (b) 1400 (c) 1300 (d) 1250

Direction : (Q.No. 32 to 36) In each question below, there are three statements followed by four conclusions numbered I, II, III & IV. You have to take the statements to be true even if they seem to be at variance with commonly known facts and then decide which of the given conclusions logically follow(s) form the given statements.

32.) Statements: a) No pain is a pen.

b) All injured are worried.

c) No pen is worried.

Conclusions: I. Some pens are worried II. Some injured are not worried.

III. Some injured are not pen IV Some pen are injured.

(a) Only II follows. (b) Only III follows. (c) Either III or IV follows (d) Only I & IV follows.

33.) Statements: a) All businesses are dull.

b) Some businesses are global.

c) No global is local.

Conclusions: I. Some businesses are not global. II. Some dull are not local

III. No dull is local IV. Some locals are businesses.

(a) Either II or III follows (b) Only IV follows.(c) None follows (d)Only I follow.

34.) Statements: a) Some keys are locks.

b) Some keys are fakes.

c) All fakes are spades.

Conclusions: I. Some locks are fakes II. Some spades are locks.

III. Some spades are fakes. IV. Some keys are spades.

(a) None follows. (b)Only II & IV follows.(c) Only III follows.

(d) Only IV follows.

35.) Statements: a) Some employees are bureaucrats.

b) No employee is a servant.

c) Some servants are masters.

Conclusions: I. Some servants are bureaucrats II. Some employees are masters.

III. Some servants are masters IV. Some employees are not masters.

(a) Only IV follows. (b) Only II & III follows. (c) Either II or IV follows (d) Only I & II follows.

36.) Statements: a) Some rural are urban.

b) No urban is a village.

c) All villages are building.

Conclusions: I. No village is a building. II. All villages are buildings.

III. No urban is a village. IV. Some rural are not villages.

(a) Only I, II, III follows. (b) None follows (c) Only I & Either II or III follows

(d) Only II & IV follows.

Direction : (Q.No. 37 to 41) Read the following information carefully, and answer the questions given below:

(i) Seven friends Kishore, Rahul, Ajay, Sujata, Preeti, Madhukar, and Harish Chandra are studying in seven different schools, viz Hansraj Modern School, madern School, Airforce Bal Bharti, Kendriya vidyalaya, Ramjas Public School, Prabhu Dayal Public School, and Springdale Public School.

But no student reads in the school whose name starts with the first initial letter of his/her name.

(ii) Rahul and Preeti study in Modern School and Airforce Bal Bharti respectively.

(iii) Ajay reads neither in Springdale Public School nor in Prabhu Dayal Public School.

(iv) Sujata and HarishChandra do not study in Prabhu Dayal Public School, Ramjas Public or Springdale Public School.

37.) Kishore reads in which school?

(a) Prabhu Dayal Public School (b) Springdale Public School.

(c) Kendraya Vidyalaya (d) can't be determined.

38.) Who studies in Ramjas Public School?

(a) Sujata (b) Ajay.

(c) Either Ajay or Sujata (d) can't be determined.

39.) Madhukar reads in which school?

(a) Prabhu Dayal Public School (b) Springdale Public School.

(c) Either Springdale or Prabhu Dayal Public School

(d) can't be determined.

40.) Who reads in Kendraya Vidyalaya?

(a) Harishchandra (b) Madhukar

(c) Rahul (d) can't be determined.

41.) Who reads in Prachu Daya Public School?

(a) Kishore (b) Madhukar.

(c) Either Kishore or Madhukar (d) can't be determined.

Direction : (Q.No. 42 to 46) in each of following letter series, some of the letters are missing which are given in that alternative as one of the alternatives below it. Choose the correct alternative.

42.) _ _ a b a _ _ b a a b

(a) a b b b a (b) a b b a b (c) b a a b b (d) b b a b a

43.) a b _ _ _ b _ b b a a _

(a) a b a a b (b) a b b a b (c) b a a a b (d) b a b b a

44.) a b _ a a b b b a a a b b a

(a) a b b a (b) b a a b (c) a a a b (d) a b a b

45.) c _ b b b _ _ a b b b b _ a b b b _

(a) a a b c b (b) a b c c b (c) a b a c b (d) b a c b b

46.) a d b _ a c _ d a _ c d d c b _ d b c _ c b d a

(a) b c c b a (b) c b b a a (c) c c b b a (d) b b c a d

Identify the grammatical error if any, from the sections marked in the following sentences

47) Math , developed over 2000 years ago, have been a favorite of teachers and
A B C

school children alike for generations.
D

48) The answers given by the commission appears to contradict the earlier testimony
A B C

of its members .
D

49) John Keats and Shelley , each of whom is an accomplished poet, is still well
A B C D

known today

50) Some animals , such as the hedgehog , appear quite timid but they can become
A B C

fierce enemies when they perceive a threat to their baby .
D

51.) Everyone in the department who worked with Rina personally congratulated her
A B

on her promotion and told her how much they enjoyed her company
C D

52.) The safety check of the new vehicle , including an inspection of the brakes and
A B
wheel ,was performed by the mechanic and him . No Error
C D

53.) Although many young children would like to have pets most find it difficult to be
A B C
responsible to another living creature at such a tender age. No Error
D

54). It was only last month that the hockey playoffs finally ended , but the new
A B C
session has started today.
D

55.) Regular exercise and healthy diet will not only increase a person's energy level
A B
but also improving physical fitness .
C D

56). The postman assured his customers that neither heat nor rain were the cause of
A B C D
the delay in their mail delivery .

Choose the word opposite in meaning to the capitalized word

57) RIFE
a) Multitudinous b) Blemished c)Sturdy d)Sparse

58) HYPOCRITICAL
a) Forthright b) Unorthodox c) Circumspect d)Puritanical

59) DERISION
a) Urgency b) Admonishment c) Uniqueness d) Acclaim

60) FLOWER
a) Burgeon b) Exact c) Blight d) Stabilize

------- end of part one-------

PART – II (Questions 61 to 90)

GENERAL ENGINEERING

61) Condition for the validity under Ohm's law is that the

A temperature should remain constant.

B current should be proportional to voltage

C resistance must be wire wound type.

D all of the above

62) The resistance of wire varies inversely as

A area of cross-section is reduced

B length

C resistivity

D temperature

63) Pure metals generally have

A high conductivity and low temperature coefficient

B high conductivity and large temperature coefficient

C low conductivity and zero temperature coefficient

D low conductivity and high temperature coefficient

64) Resistivity or specific resistance is measured in

A Ω - m B Ω / m

C Ω/ m^3 D Ω / m^2

65) Substances having a large number of free electrons and offering low resistance are called the

A inductors B conductors

C semi- conductors D insulators

66) A 100 W bulb is connected in series with a room heater. If now 100 W bulb is replaced by a 40 W bulb, the heater output will

A increase B decrease

C remains same D uncertain

67) 1 kwh is equal to

A 860 Kcal B 36×10^{5} ergs

C both (A) & (B) D none of these

68) For determining the polarity of the voltage drop across a resistor, we do not require value of

A resistor B current

C emf of the circuit D all of these

69) The rating of fuse wire is always expressed in

A volts B amperes

C ampere – volts D ampere hours

70) The insulation on current carrying conductor is provided to prevent

A Current leakage B shock

C Both (A) & (B) above D none of these

71) The electro – magnet is made of

A soft iron core

B steel core

C soft iron core wrapped in a coil of fine wire with current flowing through it

D all of the above

72) The magnitude of force acting on a current carrying conductor placed in a magnetic field is independent of

A flux density

B length of conductor

C cross –sectional area of conductor

D current flowing through the conductor

73) A material obey's Hooke's law up to

A Plastic limit B Elastic limit

C Yield point D Limit of proportionality

74.) Impact strength of a material is an index of its

A toughness B tensile strength

C capability of being cold worked D hardness

75.) Principal planes are planes having

A maximum shear stress B no shear stress

C minimum shear stress D none of these

76) In a cantilever, maximum deflection occurs where

A bending moment is zero B bending moment is maximum

C shear force is zero D slopes is zero

77) General gas equation is

A $PV = R T$ B $PV = m RT$

C PV = constant D PV^n = constant

78) A system comprising of a single phase is known as

A open system B close system

C homogeneous system D heterogeneous system

79) The fastest moving gas molecules are of

A Oxygen B hydrogen

C Chlorine D nitrogen

80) The absolute pressure of a given mass of a perfect gas varies inversely as its volume, when the temperature remains constant. This statement is

A Boyle's law B Charle's law

C Gay Lussac Law D All of the above

81) Principle constituents of fuel are

A oxygen and hydrogen B carbon and hydrogen

C sulphur and hydrogen D sulphur and oxygen

82) A chemical reaction is a process which

A Transforms one or more substance into new substances
B Involves breaking of bonds between atoms of reacting substances.
C Both A) and B)
D None of these

83) In exothermic reaction the reactants

A Have less energy than the products formed
B Have more energy than the products formed
C Are at lower temperature than products.
D Have equal energy as products.

84) What is the measure of acidity of an acid

A pH B Freezing Point
C Melting Point D Boiling Point

85) Metals are good conductors of heat and electricity because

A They have no valence electrons
B They have metallic atoms
C They have free electrons
D They are very reactive.

86)A process of forming a thick oxide layer of aluminium is called as

A Galvanizing B Oxidation
C Anodizing D Reduction

87)Semiconductors are basically

A Metals B Non metals
C Transition metals D Metalloids

88)Which kind of mirror can be used to put a piece of paper on fire with sunlight

A Convex B Concave
C Plane Concave D Plane Convex

89.) An Electric current produces

A Magnetic Effect B Heating Effect
C Both a & b D Neither a nor b

90.) The speed of DC motor can be increased by

A Increasing number of turns
B Increasing current through the motor
C Increasing current magnetic field
D All of the above

---------- end of part II ----------

PART – III(Questions 91 to 180)

Common for Electrical Engineering and Equivalent

91). A 45-V source with an internal resistance of 2 ohm is connected across a wire wound resistor. Maximum power will be dissipated in the resistor when its R is

A zero B 2 ohm

C 45 ohm D infinitely large.

92)..Cells are connected in series in order to .

A increase the current rating.

B increase the voltage rating.

C increase the life of the cells.

D none of these.

93). The storage battery generally used in electric power stations is

A lead acid battery

B zinc carbon battery

C nickel cadmium battery

D None of these.

94) Three resistors have the following ratings

R1 = 200 ohm ± 5%

R2 = 100 ohm ± 5%

R3 = 50 ohm ± 5 %

The percentage error when the resistors are connected in series, would be

A + 5% B ± 5%

C + 5/3% D ± 15%

95.) The resistivity of material is 1.78×10^{-8} ohm-m. This material is

A conductor B insulator

C semi conductor D none of these

96) For carbon composition resistor clour is coded with green, black, gold and silver stripes from left to right and tolerance are

A 0.5 ohm ± 5% B 0.5 ohm ± 10%

C 5 ohm ± 10% D 50 ohm ± 10%

97)The resistivity of material is 1.78×10^{-8} ohm-m. This material is

A conductor B insulator

C semi conductor D none of these

98). Which of the following is the poorest conductor of electricity?

A copper B mangnanin

C nichrome D none of these

99) Nichrome is used for

A overhead line wires. B heater coils

C lamp filaments D none of these

100) If the diameter of a copper wire is doubled its current carrying capacity becomes

A four times B twice

C half D none of these

101) Three resistances of 30 ohms, 20 ohms and 10 ohms are connected in parallel. The combined resistance will be

A less than 10 ohms

B greater than 10 ohms but less than 20 ohms

C greater than 20 ohms but less than 30 ohms

D None of these

102) The value of temperature coefficient of resistance of a given conductor is

A different at different temperatures

B same at different given temperatures

C increased as temperature is increased

D always constant

103) Copper has less resistance than aluminum and has greater tensile strength than aluminum. To work, copper proves an excellent material as compared to aluminum. In spite of this, now-a-days, aluminum is extensively used in transmission and distribution of power supply because

A it is cheaper than copper.

B copper is not available

C it is light in weight

D it is easily available

104) The condition in Ohm's law is that

A the temperature should remain constant

B ratio V/I should be constant

C the temperature should vary

D current should be proportional to voltage.

105) The resistance R_1 and R_2 are connected in parallel. The ratio of values of resistance R_1: R_2 is 4:1. The current in R1 R2 will be equal to

A 4:1 B 1:4

C 1:1 D 4:4

106) Kirchhof's law states that in a closed loop of a circuit

A That total current, algebraically summed is zero.

B the algebraic sum of the potential differences is zero

C The voltage across the components is zero.

D None of these

107) Which of the following wires has the highest resistance?

A Copper wire of 5m and 2 mm^2

B Copper wire of 1m and 6 mm^2

C Aluminium wire of 8 m and 1 mm^2

D Aluminium wire of 1 m and 6 mm^2

108) A resistance of 4 ohms is connected across 100 V supply. When another resistor of 'R' ohms is connected in parallel with 4 ohms, the total current taken from supply was found to be 50 A the value of resistance 'R' is

A 4 ohms B 2 ohms

C 3 ohms D 5 ohms

109) Four identical bulbs are connected in series and supplied with 400 V battery. The Current through the third bulb if battery is supplying one ampere, is

A 1.5 amps B 1.0 amps

C 2.0 amps D 1.2 amps

110) The Voltage applied across electric press was reduced by 50%. The power consumed by the press will be reduced by

A 50% B 60%

C 75% D 25%

111) A 230 V, 100 W, bulb and a 230 V, 25 W bulb are connected in series across 230V DC supply the bulb, which burns brighter is

A 100 W bulb B 25 W bulb

C both will have some brightness Dboth will not burn at all.

112) In RLC circuits, the current at resonance is

A maximum in series circuit and minimum in parallel circuit

B maximum in parallel circuit and minimum in series circuit.

C maximum in both the circuits

D minimum in both the circuits

113) A series resonant circuit is capacitive at f = 100 Hz. The circuit will be inductive somewhere at

A f < 100 Hz

B $f > 100$ Hz

C $f = 100$ HZ by increasing the value of the resistance

D None of these

114) In a series RL circuit, R= 20 ohms, L= 0.1 H and frequency is 50 Hz. The impedance of the circuit would be doubled by making

A R= 40 ohms B R= 52.6 ohms

C R= 67.5 ohms D R = 72.5 ohms

115) In series as well as parallel resonant circuits, increasing the value of resistance would be lead to

A increase in the band-width of both the circuit.

B decrease in the band-width of both the circuit

C Increase in band width in series circuit and decrease in parallel circuit

D decrease in band width series circuit and increase in parallel circuit.

116) The exact natural frequency of free oscillations in an oscillatory circuit with capacitance of 0.055 μ F, inductance 2μ H and resistance 1 ohm will be

A 478 kHz B 337 kHz

C 272 kHz D 192 kHz

117) The transient currents are due to

A voltage applied to circuit

B resistance of the circuit

C impedance of circuit

D changes in stored energy in inductors and capacitance.

118) Two coupled coils of L1 = 0.8 H and L2 = 0.2H have a coupling coefficient k = 0.9. The mutual inductance M is

A 0.144 H B 0.23H

C 0.36H D 0.43H

119) Machinability of plane carbon steel is improved by small addition of

A silicon B sulphur

C phosphorous D None of these

120) Semiconductors have electrical conductivity of the following orders (ohm-cm) $^{-1}$

A 10^{-5} B 10^{3}

C 10^{4} D None of these

121) With increase in temperature, electrical resistance of a semiconductor.

A increases B decreases

C remains constant D None of these

122) The Half's Coefficient for a particular material was found to be zero. The material is

A metal B intrinsic semi-conductor

C insulator D any of these

123) The thickness of the depletion layer in an PN junction is of the order of

A 10^{-6} m B 10^{-10} m

C 10^{-4} m D None of these

124) A PN junction is

A a rectifier B an amplifier

C an insulator D None of these

125) The most important factor which can influence the operation of a PN junction is

A impurity atom concentration B temperature

C mobility of change carriers D all of these

126) The material used for photo conductive cell is

A ZnS B PbS

C CdS D none of these

127) It is possible to obtain P-type or N-type semiconductor from a single compound by adding Ge. That compound is

A InSb B GaP

C GaAs D None of these

128) The forbidden energy gap for germanium is

A 0.3eV B 3.5eV

C 0.7eV D 1.12eV

129) Fermi energy is the amount of energy which

A a valence electron can have at room temperature

B must be given to an electron to move it to conduction band

C must be given to a hole to move it to valence band

D a hole can have at room temperature

130) The current due to electron flow in conduction band is

A less than the hole current valence band

B equal to the hole current in valence band

C grater than the hole current in valence band

D none of these

131) An electron rising through a potential of 500V will acquire energy of

A 800×100^{-22} joules B 800eV

C 500 joules D 500eV

132) For pure germanium the density of the charge carriers is $2.5 \times 10^{13}/cm^2$ and electron and hole mobilities at 300^0 K are 3600 cm^2/V-sec and 1700 cm^2/V-sec respectively. Its conductivity would be

A 0.02 mho/cm B 0.5 mho/cm

C 0.05 ohm-cm D 0.2 ohm-cm

133) Which of the following statements is not true for an intrinsic semiconductor?

A The number of holes is less then the number of Electrons

B The product of hole concentration and electron concentration is a constant

C The net charge density of the materials is zero

D All of these

134) The full load current of a 20 HP, 500 V d.c. motor will be closer to

A 100 A B 60A

C 35A D 15A

135) The following controls are considered for d.c. motors

I Control of flux

II Armature resistance control

III Supply voltage control

Which of the following controls play significant role in the speed control of d. c. motors?

A I Only B II and III only

C I and III Only D I, II, and III

136) The torque of a shunt motor is proportional to

A armature current B applied voltage

C Square of the armature current D None of these

137) IF the load current and flux of a d.c. motor are held constant and voltage applied across its armature is increased by 5% , the speed of motor will

A increase by about 5% B reduced by about 5%

C remain unaltered D depends on other factors

138) The armature voltage control is considered as suitable, in case the d. c. machine is driven at

A constant torque B constant speed

C constant power D constant current

139) In a properly designed d. c. generator of 10kW capacity, total losses may be of the order of

A 50W B 500 W

C 2500 W D 5000W

140) The d. c. motor develops a torque of 140 N.m at 1400 rpm. If the motor now runs at 1000 rpm, the torque developed will be

A 140 N.m B 2000 N. m

C 71 N.m D 51 N m

141) The insulation between the segments of commulator for d.c. machine is

A Wood B Paper

C Fabric D Mica

142) The induced emf of a d. c. machine is

A directly proportional to speed

B inversely proportional to speed

C proportional to square of speed

D None of these

143) A 4-pole d. c. machine has lap winding. The winding is removed and then a wave winding is put. The induced emf will

A increase B decrease

C remain the same D None of these

144) In a d. c. generator, the polarity of an inter pole is

A the polarity of the next main pole

B the polarity of the main pole immediately following the inter pole

C the polarity of the main pole opposite to the inter pole

D None of these

145) The leakage flux in a transformer depends upon

A the applied voltage B the frequency

C the load current D the mutual flux

146) The efficiency of transformer at full load 0.8 p. f. lag is 90%. Its efficiency at full load 0.8 p. f. lead will be

A less than 90% B more than 90 %

C 90% D None of these

147) Distribution transformers have core losses

A greater than copper losses

B equal to copper losses.

C less than copper losses.

D equal to ½ (copper losses)

148) Eddy current loss in a transformer depends on

A both voltage and frequency B voltage alone

C load current alone D thickness of core

149) The short- circuit test on a transformer is conducted to obtain

A core losses at any load

B ohmic losses at any load.

C hysteresis losses

D both core losses and ohmic losses.

150) In a transformer, the tappings are provided on

A h. v. side at one end of the winding

B l. v. side at one end of the winding

C h. v. side at the middle

D l. v. side at the middle

151) In an oil – filled transformer, oil is provided for

A cooling B insulation

C lubrication D both cooling and insulation

152) Transformer cores are laminated to reduce

A eddy current loss B hysteresis loss

C both eddy current & hysteresis loss D ohmic loss

153) CRGO laminations in a transformer are used to minimize

A eddy current loss B hysteresis loss

C both eddy current & hysteresis loss D ohmic loss

154) An air- core transformer, as compared to iron- core transformer, has

A less magnetic core loss B more magnetic core loss

C no magnetic core loss D less ohmic loss

155) One 200 V, 100 W bulb is connected in series with the primary of a 200 V, 10 kVA transformer. If its secondary is left open circuited, then bulb would have

A full brightness

B poor brightness

C a little less than full brightness

D more than full brightness

156) Alternator works on the principle of

A mutual induction

B Faraday's laws of electro-magnetic induction

C self induction

D self and mutual induction

157) The rotor of the alternators requires

A d.c. B a.c.

C pulsating d. c. D None of these

158) In large size alternators, flux is kept

A stationary B rotating

C either (A) or (B) is correct D None of these

159) The generator which gives d. c. supply to the rotor is called

A convertor B exciter

C invertor D rectifier

160) The frequency of e.m.f. generated depends upon

A speed of the alternator

B number of poles of the alternator

C type of alternator

D Both (A) and (B) are correct

161) An alternator running at 3000 r. p. m. generates voltage at 50 Hz. The number of poles of the alternator will be

A 8 poles B 6 poles

C 4 poles D 2 poles

162) The salient pole type rotors are

A smaller in axial length

B larger in axial length

C smaller in diameter

D larger in diameter and smaller in axial length

163) The alternators are operated in parallel because

A it is convenient and economical in repairing

B. it maintains better stability of supply

C. it is easy to install an additional unit as and when required

D. All the above three

164) When two alternators are running in parallel, if prime-mover of one of the alternators is disconnected, that alternator will

A. stop running

B. run as a synchronous motor

C. run as generator

D. None of these

165). A 120 MW turbo-alternator is supplying power to 80 MW load at 0.8 p.f. lagging. Suddenly the steam supply to the turbine is cut off and alternator remains. Connected to the supply network and the field supply also remains on. What will happen to the alternator?

A. The stator winding of the alternator will get burnt

B. The rotor winding of the alternator will get burnt

C. The alternator will continue to run as a Synchronous motor rotating in same direction.

D. The alternator will continue to run as a Synchronous motor rotating in opposite direction.

166) In a 3-phase slipring induction motor, the numbers of poles in the rotor windings are kept

A. same as of the number of stator poles

B. more than the number of stator poles

C. less than the number of stator poles

D. independent of the stator pole.

167) At full load, the current induced in the rotor conductor of a 3- phase squirrel cage induction motor is

A. more than rated current

B. less than rated current

C. nearly equal to rated current

D. None of these.

168) If the rotor terminals of a 3-phase slip-ring induction motor are not short-circuited and the supply is given to the stator, the motor will

A. not start
B. start running
C. run at high speed
D. run at low speed

169) A 3-phase, 4-pole induction motor works on 3-phase, 50c/s, supply . If the slip of the motor is 4% the actual speed with be

A. 1500 r.pm
B. 1460 r,p,m.
C. 1440 r.p.m.
D. 720 r.p.m.

170) When the line voltage of an induction motor is reduced to 75% of its rated value, the starting current will be reduced by

A. 75%
B. 50%
C. 25%
D. No change in the current

171) Star-delta and auto transformer starters are used with 3-phase induction motors because they

A. have high starting torque
B. may not run in reverse direction
C. draw 5 to 7 times the full load current at the time of starting
D. pick up high speed immediately

172) The speed of the squirrel cage induction motor can be controlled by

A. changing supply frequency
B. changing number of poles
C. reducing supply voltage
D. All of these

173) The speed of the slipring induction motor can be controlled by

A. changing supply frequency
B. changing number of poles
C. changiag the resistance of the rotor winding
D. All of these.

174) The ratio error in a CT is due to

A. Power factor of primary

B. Wattless component of the current in the primary

C. exciting current

D. leakage flux

175) Which of the following meter is not a current meter?

A. Moving-coil meter

B. Hot-wire type meter

C. Thermocouple meter

D. None of these.

176) Which of the following meters cannot measure both dc as well as ac

A. Moving-iron meter

B. Dynometer

C. Thermocouple meter

D. Induction-type meter

177) When the load on the generator was 2.5 MW the heat rate in Kcal/ MW hr was nearly.

A 16×10^6 B 20×10^6

C 30×10^6 D 21.3×10^6

178) An interconnected system has the following plants:

I. Run off the river plant. III. Steam power plant.

II. Nuclear power plant. IV. Diesel Engine plant.

Which two plants can be exclusively used for base load?

A. I and II B. II and III C. II and IV D. II only.

179) Suspension type insulators are used for voltage beyond

A 220 V B 400 V

C 11 KV D 33 KV

180) Which type of plant has the minimum cost per KWh of energy generated?

A. Hydro – Electric plant
B. Thermal power plant
C. Nuclear power plant.
D. Diesel power plant.

---------- end of part 3 ----------