NATIONAL POWER TRAINING INSTITUTE
(Under Ministry of Power, Govt. of India Organization)

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

Date of Examination:- 19th June, 2011   Duration of the Exam:- 11:00 AM to 01.30 PM
Entrance Test Details:- Duration – 150 Minutes   Type:- Objective (180 Questions)

The correct answer is to be chosen from the four options i.e. 1, 2, 3, and 4 given at the end of each question.

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.
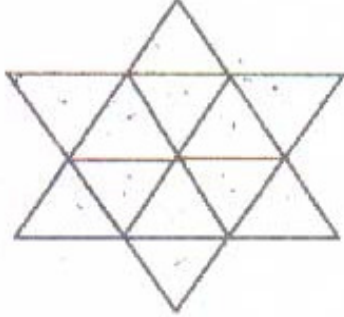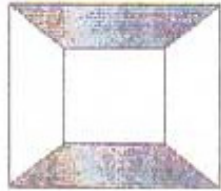
Q.No	PART- I (General Aptitude)
1	What natural number is represented by a binary number 1100110011
	(1) 1843
	(2) 1331
	(3) 307
	(4) 819
2	Which number out of the following is least like others
	1 3 5 7, 11 13 15 17 19
	(1) 11
	(2) 13
	(3) 15
	(4) 19
3	In the given pair of numbers, which pair is different from the rest:
	(1) 28:36
	(2) 21:24
	(3) 35:45
	(4) 21:27
4	The following words follow a logical progression:
	Drama
	Rabbi
	Cycle
	Idled
	Tense
	Affix
	Which of the following words could be the next?
	(1) Wiggle (2) Flute (3) Media (4) Hatch
5	Ram and Shyam run a 100 meter race ,where Ram beats Shyam by 10 meters. To do a favour to Shyam, Ram starts meters behind the starting line in a second 100 meter race. They both run at their earlier speeds. Which of the following is true in case of second race?
	(1) Ram and Shyam reach the finishing line simultaneously
	(2) Shyam beats Ram by 1 meter
	(3) Shyam beats Ram by 11 meter
	(4) Ram beats Shyam by 1 meter
6	Three cities X, Y and Z are interconnected with each other by very good roads.
	If X is 42 km from Y and the distance between X and Z is 66 km. Then which of the following cannot be the distance between Y and Z
	(1) 28 km (2) 23 km (3) 32 km (4) 98 km
7	
	In the circle shown here with centre O if angle ACB is 40 degrees then what is the measure of angle AOB?
	(1) 40 degrees (2) 80 degrees (3) 120 degrees (4) 50 degrees

8	Two boys A and B are walking down an escalator in the direction of the motion of the escalator. A takes two steps on the same time when B takes one step. When A covers 60 steps he gets out of the escalator while B takes 40 steps to get out of the escalator. Find the number of steps in the escalator when it is stationary? (1) 80 (2) 90 (3) 120 (4) 150
9	If 16 books are distributed among 4 children such that each gets at least 3 books, the number of ways of distributing them is (1) 30 (2) 210 (3) 15 (4) 35
10	What is the area enclosed by the graphs $y = |x + a|$ and $y = 5$? (1) 25 sq. units (2) 50 sq. units (3) 75 sq. units (4) Data insufficient
11	If $X^2 - |X| - 2 \geq 0$ then (1) $-2 < X < 2$ (2) $X < -2$ or $X > 2$ (3) $X < -2$ or $X > 1$ (4) $-2 < X < 1$
12	After striking the floor, a rubber ball rebounds to $4/5^{th}$ of the height from which it has fallen. Find the total distance that it travels before coming to rest if it has been gently dropped from a height of 120 meters. (1) 540 meters (2) 960 meters (3) 1080 meters (4) None of these
13	Three of the six vertices of a regular hexagon are chosen at random. The probability that the triangle with these vertices is equilateral is (1) 1/10 (2) 3/10 (3) 1/5 (4) 4/10
14	In how many ways a cricketer can score 200 runs with fours and sixes only? (1) 13 (2) 18 (3) 19 (4) 17
15	Find the ratio of diameter of the circles inscribed in and circumscribing an equilateral triangle to its height. (1) 1 : 2 : 1 (2) 1 : 2 : 3 (3) 1 : 3 : 4 (4) 3 : 2 : 1

16	Nishit travels from Delhi to Agra, a distance of 200 km at the speed of 40 km/h. At the same time, Ravi starts from Agra at a speed of 20 km/h along a road, which is perpendicular to the road on which Nishit is travelling. When will Nishit and Ravi be closest to each other?
	(1) In 1.5 hours
	(2) In 4 hours
	(3) In 3.33 hours
	(4) In 5 hours
17	In two alloys, aluminium and iron are in the ratios of 4:1 and 1:3. After alloying together 10 kg of first alloy, 16 kg of second alloy and several kilograms of pure aluminium, an alloy was obtained in which the ratio of aluminium to iron was 3:2. Find the weight of the new alloy.
	(1) 95
	(2) 65
	(3) 35
	(4) 15
18	What are the last two digits of 7^{2004}
	(1) 21
	(2) 01
	(3) 61
	(4) 81
19	Three faces of a dice are yellow, two faces are red, and one face is blue. The dice is tossed three times. Find the probability that the colours yellow, red, and blue appear in the first, second, and the third toss respectively.
	(1) 1/18
	(2) 1/12
	(3) 1/9
	(4) 1/36
20	If a, b, c, d, e and f are non negative real numbers such that $a + b + c + d + e + f = 1$, then the maximum value of $ab + bc + cd + de + ef$ is
	(1) 1/4
	(2) 1
	(3) 6
	(4) 1/6
21	S1 and S2 are two sets of parallel lines. The number of lines in S1 is greater than the number of lines in S2. They intersect at 12 points. The number of parallelograms that S1 and S2 may form is
	(1) 12 or 6
	(2) 8 or 4
	(3) 18
	(4) 18 or 15
	Direction for questions 22 to 25: Read the passage given below and answer the questions that follow:
	There were 6 gentlemen who were out at Megacity Shopping Mall Each one of them bought one item only. The 6 gentlemen are – Mr. Garg, Mr. Pandey, Mr. Sharma, Mr. Chowbey, Mr. Harsh, Mr. Handa. The items bought (not necessarily in the order) were – Dress, Sweater, Dresser, Telephone, Tires, Bicycle. The original prices of these items (not necessarily in the order) was – Rs. 200, Rs. 1500, Rs. 300, Rs. 2000, Rs. 900 and Rs. 1200 and the prices paid (after various discounts) were – Rs. 800, Rs. 600, Rs. 1200, Rs. 1000, Rs. 75, Rs. 50. The following information is available to us:
	1. Mr. Garg found a clothing item.
	2. The bicycle was bought at 50% off the buyer name starts with H.

	3. Mr. Chowbey bought the item priced at Rs. 1500 for 4/5 ths of the amount. 4. The tires set was sold for Rs. 100 less than the asking price. 5. The item that was sold for Rs. 50 was an article of clothing. 6. Mr. Pandey spent Rs. 400 less than Mr. Chowbey. 7. Mr. Harsh paid for the dress with a Rs. 100 note (value equal to 50% the original price) and received Rs. 25 in change. 8. Mr. Garg spent less for the item, than Mr. Sharma, who spent less than Mr. Pandey. 9. The item originally priced the highest did not sell for the highest price. Nor did the lowest priced item sell for the lowest amount. 10. The paid price for telephone was more than the dresser.
22	Who bought the dresser? (1) Mr. Garg (2) Mr. Pandey (3) Mr. Sharma (4) Mr. Handa
23	Who paid the highest price? (1) Mr. Sharma (2) Mr. Handa (3) Mr. Harsh (4) Mr. Chowbey
24	What did Mr. Handa buy? (1) The bicycle (2) The sweater (3) The tires (4) The dresser
25	What was the percentage discount on the highest original price item? (1) 70% (2) 50% (3) 25% (4) 75%
26	Garima's age is 1/6th of her father's age. Garima's father's age will be twice of Vimal's age after 10 years. If Vimal's eighth birthday was celebrated two years before, then what is Garima's present age? (1) 30 years (2) 24 years (3) 6 years (4) None of these
27	A started a work and left after working for 1 day. Then B was called and he finished the work in 4.5 days. Had A left the work after working for 1.5 days, B would have finished the remaining work in 3 days. In how many days can each of them, working alone, finish the whole work? (1) 3.5 days, 8.5 days (2) 2.5 days, 7.5 days (3) 5 days, 15 days (4) None of these
28	Out of a total 85 children playing badminton or table tennis or both, total number of girls in the group is 70% of the total number of boys in the group. The number of boys playing only badminton is 50% of the number of boys and the total number of boys playing badminton is 60% of the total number of boys. The number of children playing only table tennis is 40% of the total number of children and a total of 12 children play badminton and table tennis both. What is the number of girls playing only badminton? (1) 17 (2) 16 (3) 14 (4) Data inadequate

29	The angle of elevation of a patch of cloud from a point x meters above the surface of a pool is 30° and the angle of depression of its reflection is 60°. What is the height of the cloud patch above the surface of the pool?
	(1) 2x meters
	(2) √2x meters
	(3) x meters
	(4) x / √3 meters
30	How many different words can be formed with the letters of 'PUNJAB', when both P and N are together?
	(1) 120
	(2) 240
	(3) 144
	(4) None of these
31	The average of five consecutive odd numbers is 61.What is the difference between the highest and the lowest numbers?
	(1) 2
	(2) 5
	(3) 8
	(4) 9
32	The average monthly income of P and Q is Rs.5050. The average monthly income of Q and R is Rs.6250 and the average monthly income of P and R is Rs.5200.The monthly income of P is:
	(1) Rs. 3500
	(2) Rs. 4000
	(3) Rs. 4050
	(4) Rs. 5000
33	If 50 is subtracted from two-third of a number, the result is equal to sum of 40 and one-fourth of that number. What is the number?
	(1) 174
	(2) 216
	(3) 246
	(4) 336
34	A is two years older than B who is twice as old as C. If the total of the ages of A,B and C is 27, then how old is B?
	(1) 7 years
	(2) 8 years
	(3) 9 years
	(4) 10 years
35	0.01 is what percent of 0.1
	(1) 1/100
	(2) 1/10
	(3) 10
	(4) 100
36	A scored 30 % marks and failed by 15 marks. B scored 40 % marks and obtained 35 marks more than those required to pass. The pass percentage is:
	(1) 33
	(2) 35
	(3) 38
	(4) 43

37	In the figure given below how many triangles (any size) are there?

(1) 12   (2) 14   (3) 18   (4) 20

38	If 20-2 = 20; 25-4 = 50; 30-8 = 120, then 24-6 = ?

(1)   8

(2)   12

(3)   16

(4)   72

39	In a square park shown below (not to scale) of side 40 meter which has a square platform of side10 meter exactly at the centre. What will be the cost of putting grass in the portion shown in black @ Rs.10/sq meter

(1) Rs.3750   (2) Rs. 7500   (3) Rs.7750   (4) Rs.15000

40	A circular wire of radius 42 cm is cut and bent in the form of a rectangle whose sides are in the ratio 6:5 Then the smaller side of the rectangle is

(1) 48 cm

(2) 24 cm

(3) 60 cm

(4) 21 cm

41	A rectangular courtyard 3.78 meters long and 5.25 meters wide is to be paved exactly with square tiles, all of the same size. What is the largest size of the tile which could be used for the purpose?

(1) 14 cm

(2) 21 cm

(3) 28 cm

(4) 42 cm

42	A worker may claim Rs.1.5 for each km which he travels by auto rickshaw and 50 paisa for each km he drives his own scooter. If in one week he claimed Rs. 50 for travelling 80 kms,how many kms did he travel by auto rickshaw?

(1) 10

(2) 20

(3) 30

(4) 40

43	A reputed company announces a scheme of giving two shirts free if one buys three shirts. What discount I get if I purchase the shirts under this scheme? (1) 20.00 % (2) 33.34 % (3) 40.00 % (4) 66.67 %
44	What price should a shopkeeper mark the price of a garment which costs him Rs.1200 in order that he may offer a discount of 20% on the marked price and still make a profit of 25% (1) Rs.1675 (2) Rs.1875 (3) Rs.1900 (4) Rs.2025
45	X and Y are two alloys of gold and copper made by mixing these metals in the ratio 7:2 and 7:11 respectively. Now if a third alloy Z is made by melting these two alloys(X and Y) in equal quantities, the ratio of gold and copper in Z will be (1) 5:7 (2) 5:9 (3) 7:5 (4) 9:5
46	If 9 men can pack a certain number of items in 12 days, working 5 hours a day; for how many hours a day would 4 men have to work in order to pack twice the number of items in 30 days (1) 6 (2) 8 (3) 9 (4) 10
47	A train 110 meters long is running with a speed of 60 km per hour. In what time will it pass a man running at 6 km per hour in the direction opposite to that in which the train is going? (1) 5 seconds (2) 6 seconds (3) 7 seconds (4) 10 seconds
48	If a man saves Rs 1000 each year and invests at the end of the year at 5% compound interest, how much will the amount be at the end of 15 years? (1) Rs. 21,478 (2) Rs. 21,578 (3) Rs. 22,578 (4) Rs. 22,478
49	Insert the missing number 9, 26, 65, 215, 344, (_____) (1) 471 (2) 473 (3) 511 (4) 513

50	Find the odd man out
	41, 43, 47, 53, 61, 71, 73, 81
	(1) 61
	(2) 71
	(3) 73
	(4) 81
	Directions for questions 51 and 52:
	There is a certain relation between two given words on one side of : : and one word is given on another side of : : while another word is to be found from the given alternatives, having the same relation with this word as the given pair has. Select the best alternative.
51	Conscience: Wrong :: Police : ?
	(1) Thief
	(2) Law
	(3) Discipline
	(4)Crime
52	Car : Petrol : : Televison : ?
	(1) Electricity
	(2) Transmission
	(3) Entertainment
	(4) Antenna
	Directions for question 53 and 54
	Read the following information carefully and answer the questions 23 and 24 on the basis of that information:
	A group of eight friends is sitting in a circle. Virat is between Amit and Sohan and is opposite to Shruti. Vishal is to the right of Amit but on the left of Anil, whose right hand neighbor is Shruti. Harsh wants Reena to his left and Sohan to his right
53	Find the person who is diagonally opposite to Amit ?
	(1) Harsh
	(2) Sohan
	(3) Shruti
	(4) Reena
54	Who is sitting second left of Harsh
	(1) Virat
	(2) Shruti
	(3) Vishal
	(4) Anil
55	How many times do the hands of a clock coincide in a day?
	(1) 20
	(2) 21
	(3) 22
	(4) 24

56	At a dinner party every two guests used a dish of rice between them. Every three guests used a dish of mixed vegetable and every four guests used a dish of meat between them. There were altogether 65 dishes. How many guests were present? (1) 60 (2) 48 (3) 65 (4) 72
57	Kishore has 16 pairs of white socks and 16 pairs of brown socks. He keeps all in the same drawer in a mixed manner. If he picks out three socks at random, what is the probability of getting a matching pair? (1) 1/3 (2) 1/2 (3) 1 (4) 2
58	A vegetable seller wants to fix the selling price of two pumpkins of same quality but different sizes on the basis of their size. The bigger one was of 60 cm circumference and other of 30 cm . If the shopkeeper keeps the price of the smaller pumpkin as Rs 5 then what should be the price of the bigger pumpkin? (1) Rs. 10 (2) Rs. 20 (3) Rs. 40 (4) Rs. 80
59	In the following series some letters are missing. Find the missing letters out of the four alternatives given __pqr__ e__qrs ep__rs epq__s (1) p q s r e (2) e s p q r (3) s p q r r (4) q p r s e
60	Two hens lay two eggs in two days. How many eggs 6 hens will lay in 6 days? (1) 6 (2) 12 (3) 18 (4) 36

Q.No	PART-II (General Engineering)
61	The property of a material by virtue of which it can be drawn into thin wire is known as
	(1) Brittleness
	(2) Plasticity
	(3) Malleability
	(4) Ductility
62	Which mirror dentists use to focus light on the tooth of a patient?
	(1) Concave mirror
	(2) Convex mirror
	(3) Plane mirror
	(4) Cylindrical mirror
63	How would a stick, held vertically in a beaker full of water, look when glanced from the sides?
	(1)Thicker
	(2)Thinner
	(3)Bent
	(4)Unchanged
64	When a metal is heated, the density of metal:
	(1)Increases
	(2)Decreases
	(3)Remains the same
	(4)First increases then decreases
65	The essential constituents of alcohol are:
	(1)Oxygen, Carbon, Nitrogen
	(2)Carbon, Hydrogen, Oxygen
	(3)Nitrogen, Hydrogen, Oxygen
	(4)Hydrogen, Oxygen, Chlorine
66	The fineness of coal in pulverized fuel fired boilers in a modern thermal power plant when compared to that of a talcum powder is:
	(1) More
	(2) Less
	(3) Almost equal
	(4) Depends upon the load
67	1 Kwh is equal to how many Kcal?
	(1)3412
	(2)860
	(3)3600
	(4)1895
68	The speed of an induction motor having 2 poles connected to a 60 hz power supply will be:
	(1)750
	(2)1500
	(3)3000
	(4)3600
69	Convert the binary number 100100 to the decimal number
	(1)36 (2)63 (3)72 (4)126

70	Of the following which one is more elastic? (1) Diamond (2) Steel (3) Aluminum (4) Wood
71	Which of the following access methods is being used in present day GSM technology? (1) FDMA (2) CDMA (3) TDMA (4) OFDMA
72	Three of the following options are the reasons to use fiber-optic cables for point to point data transmission. Then which of the options is not the reason for such data transfer? (1) Need to assure data security. (2) Avoidance of ground loops. (3) Data-transfer rates too low to use metal cables. (4) Elimination of spark hazards.
73	The lead of a pencil mainly contains (1)Lead (2) Carbon black (3) Graphite (4) Plastics
74	Which of the following is not contained in the vehicular exhaust emissions? (1) Lead (2) Ammonia (3) Carbon Monoxide (4) Particulate matter
75	The lower, dense region of the atmosphere is known as: (1)Troposphere (2) Ionosphere (3) Stratosphere (4) Hydrosphere
76	Hydrogen bomb is based on the principle of (1)Nuclear fission (2)Natural radioactivity (3)Nuclear fusion (4)Artificial radioactivity
77	Two full turns of the circular scale of a screw gauge cover a distance of 1 mm on its main scale. The total number of divisions on the circular scale is 50. Further, it is found that the screw gauge has a zero error of -0.03 mm while measuring the diameter of a thin wire, a student notes the main scale reading of 3 mm and the number of circular scale divisions in line with the main scale as 35. The diameter of the wire is (1) 3.32mm (2) 3.73mm (3) 3.67 mm (4) 3.38 mm
78	The speed of sound in a medium depends upon (1) Amplitude (2) Frequency (3) Wavelength (4) Medium properties

79	Brass is an alloy of :
	(1) Copper and Tin
	(2) Copper and Aluminum
	(3) Copper and Iron
	(4) Copper and Zinc
80	The passage of current in an electrolyte is due to movement of
	(1)Electrons (2)Molecules (3)Atoms (4)Ions
81	A solution that can resist change in its pH on addition of alkali/acid is called
	(1)Neutral solution
	(2)Ideal solution
	(3) Buffer solution
	(4) Zero pH solution
82	A bucket of water is lying on a spring balance. An iron piece is suspended from an independent support in water without touching any part of the bucket. The balance reading will
	(1)Increase
	(2)Decrease
	(3)Remain unchanged
	(4)First increase then decrease
83	Which of the following groups contains only natural fuels?
	(1) Petrol, diesel, natural gas
	(2) Petroleum, wood, coke
	(3) Coal, charcoal, wood
	(4) Coal, wood, petroleum
84	A car has an engine of 800 cc. What parameter out of the following is 800cc?
	(1) Capacity of fuel tank
	(2) Swept volume of the cylinder
	(3) Clearance volume of the cylinder
	(4) Volume of the cylinder
85	How much power in million units (mu), a power station of 100 MW capacity can generate in a day (24 hours) having 70% plant load factor?
	(1)2.40 mu (2)1.68 mu (3) 0.72 mu (4) can't be determined
86	How many isotopes of hydrogen are there?
	(1) two (2) three (3) four (4) none
87	The fastest memory in a CPU is
	(1)Associative (2) Virtual (3) Cache (4) Main
88	Study of life in outer space is known as,
	(1) Endobiology
	(2) Exobiology
	(3) Enterobiology
	(4) Neobiology
89	Speed of sound waves is maximum in:
	(1) vacuum (2) Gases (3) Liquids (4) Solids
90	A bicycle travels 168 m along a circular track around the garden having area 2464 square meter. What is the angular displacement in radians of the bicycle from its starting position?
	(1) 1.91 (2) 6.0 (3) 14.67 (4) 18.86

Q.No	Part-III (Electrical)
91.	A phase-lag compensation will (1)　improve relative stability. (2)　increase the speed of response. (3)　increase band-width. (4)　increase overshoot.
92.	Adding of poles in a transfer function causes compensation (1)　lag compensation. (2)　lead compensation. (3)　lag-lead compensation. (4)　amplification.
93.	The damping ratio of the characteristic equation $s^2 + 2s + 8 = 0$ is (1)　0.353. (2)　0.350. (3)　0.30 (4)　0.333
94.	Feedback control systems are (1)　band-pass filters. (2)　low-pass filters. (3)　high-pass filters. (4)　none of the above.
95.	In a control system, the use of negative feedback (1) eliminates the chances of instability. (2) increases the reliability. (3) reduces the effects of disturbance and noise signals in the forward path. (4) increases the influence of variations of component parameters on the system performance.
96.	HRC fuse provides best protection against (1)　Open circuit. (2)　Over load. (3)　Reverse current. (4)　Short circuit.
97.	The transformer used for AC welding sets is (1)　Booster type. (2)　Step up type. (3)　Step down type. (4)　Equal turn ratio type.
98.	Motor used for elevators is generally (1)　synchronous motor. (2)　universal motor. (3)　induction motor. (4)　reluctance motor.
99.	The maximum demand of a consumer is 2 kW and his daily energy consumption is 20 units. Its load factor is (1)　10.15%. (2)　41.6%. (3)　50%. (4)　60%.
100.	A 1mA ammeter has a resistance of 100 Ω. It is to be converted to a 1A ammeter. The value of shunt resistance is (1)　0.001 Ω. (2)　0.1001 Ω. (3)　1000 Ω. (4)　100 Ω.
101.	The high torque to weight ratio in an analog indicating instrument indicates (1)　high friction loss. (2)　low friction loss. (3)　low accuracy

102.	Swamping resistance is connected
	(1) in series with shunt to reduce temperature error in shunted ammeters.
	(2) in series with the ammeter to reduce error on account of friction.
	(3) in series with meter and have a high resistance temperature coefficient in order to reduce temperature error in ammeters.
	(4) in series with meter and have a negligible resistance co-efficient in order to reduce temperature error in shunted ammeter.
103.	The maximum value of potential gradient in a cable occurs in
	(1) conductor.
	(2) insulation.
	(3) outer sheath
	(4) all the above.
104.	A thermal protection switch is able to protect against.
	(1) over load.
	(2) over voltage.
	(3) temperature.
	(4) short circuit
105.	An isolator operates under
	(1) no load condition.
	(2) full load condition.
	(3) 50% load condition.
	(4) fault condition.
106.	The advantage of electric breaking is
	(1) it is instantaneous.
	(2) more heat is generated during breaking.
	(3) it avoids wear of track.
	(4) motor continue to remain loaded during braking.
107.	Mho relay is used to protect
	(1) long transmission line.
	(2) medium length line
	(3) short length line
	(4) all the above
108.	Differential relays are used to protect the equipment against
	(1) internal faults
	(2) revise current
	(3) over voltage
	(4) over current
109.	A booster is connected in
	(1) series with feeder
	(2) parallel with feeder
	(3) both (a) and (b) are correct.
	(4) none of the above.
110.	Voltage drop is the main consideration while designing a
	(1) feeder
	(2) distributor
	(3) service main
	(4) all the above.
111.	Ferránti effect on long overhead line is experienced when
	(1) the line is lightly loaded
	(2) the power factor is unity.
	(3) the power factors leading.
	(4) corona effect is dominant.
112.	Resistance switching is normally employed in
	(1) air blast circuit breaker
	(2) minimum oil circuit breaker.
	(3) bulk oil circuit breaker.
	(4) all the above
113.	The recovery voltage will be maximum for power factor of
	(1) zero.
	(2) 0.5.
	(3) 0.707.
	(4) unity.

114.	A 50 Hz, four pole turbo alternator rated at 20 MVA, 13.2 kV has an inertia constant H = 4 kW sec/KVA. The K.E. stored in rotor at synchronous speed is
	(1) 80 K.J.
	(2) 80 mega Joules.
	(3) 40 mega Joules.
	(4) 20 mega Joules.
115.	For a fault at the terminals of synchronous generator, fault current is maximum for
	(1) 3-phase fault.
	(2) 3-phase to ground fault.
	(3) Line to ground fault.
	(4) Line to line fault.
116.	In a single-phase repulsion motor power factor is
	(1) always leading
	(2) high at low speed.
	(3) high at high speed.
	(4) always unity.
117.	If the capacitor of a capacitor start induction motor is short-circuited, the motor will
	(1) start.
	(2) not start.
	(3) burn.
	(4) start with jerks.
118.	A 3-phase slip-ring induction motor is fed from the rotor side with stator winding short-circuited. The frequency of the currents in the short-circuited stator is
	(1) slip frequency.
	(2) supply frequency.
	(3) frequency corresponding to rotor speed.
	(4) zero.
119.	In $\dfrac{V}{f}$ speed control of 3ϕ induction motor, with increase in frequency, the maximum torque and slip at which maximum torque occurs, would respectively
	(1) increase and decrease.
	(2) increase and increase.
	(3) decrease and increase.
	(4) decrease and decrease.
120.	Semi-closed or totally closed slots are used in induction motors essentially to
	(1) improve pull-out torque.
	(2) increase pull-out torque.
	(3) increase efficiency.
	(4) reduce magnetizing current and improve power factor.
121.	The cogging occurs in induction motors due to
	(1) harmonic induction torques.
	(2) harmonic synchronous torques.
	(3) vibration torques
	(4) both (a) and (b)
122.	The stator referred resistance in the equivalent circuit of an induction motor, representing mechanical output is
	(1) $\dfrac{r_2^2}{s}$ (2) $r_2'\left(\dfrac{1}{s}-1\right)$ (3) $\dfrac{r_2'}{s}$ (4) $r_2^2\left(\dfrac{1}{s}-1\right)$
123.	Starting torque of a synchronous motor is
	(1) very low.
	(2) zero.
	(3) very high.
	(4) half-full load torque.
124.	In 3-phase synchronous motor, hunting is prevented by
	(1) dummy coils.
	(2) compensating winding.
	(3) damper winding

125.	Variation in DC excitation of a synchronous motor causes variation in
	(1) speed of motor.
	(2) power factor.
	(3) armature current.
	(4) both armature current and power factor.
126.	An alternator with high value of SCR has
	(1) poor voltage regulation and lower stability limit.
	(2) better voltage regulation and higher stability limit.
	(3) poor voltage regulation and higher stability limit.
	(4) better voltage regulation and low stability limit.
127.	Under short-circuit conditions, the power factor of an alternator is
	(1) unity.
	(2) almost zero lagging.
	(3) almost zero leading.
	(4) none of the above.
128.	Skew of rotor bar eliminates
	(1) the effect of space harmonics.
	(2) the entire effect of crawling.
	(3) magnetic noise.
	(4) vibration due to unequal force developed on rotor.
129.	In current transformers turn compensation is provided mainly to reduce the
	(1) power losses.
	(2) phase angle error.
	(3) ratio error.
	(4) both ratio and phase angle errors.
130.	The primary current in a CT is dictated by
	(1) the secondary burden.
	(2) the core of the transformer.
	(3) the load current.
	(4) primary winding of transformer.
131.	Scott-connections are used for
	(1) single phase to three phase transformation.
	(2) three phase to single phase transformation
	(3) three phase to two phase transformation
	(4) any of the above/
132.	A centre zero ammeter connected in the rotor circuit of a 6-pole, 50 Hz induction motor makes 30 oscillations in one minute. The rotor speed
	(1) 970 rpm.
	(2) 990 rpm.
	(3) 1010 rpm..
	(4) 1030 rpm.
133.	The chemical used in breather is
	(1) sodium chloride.
	(2) silica sand.
	(3) silica gel.
	(4) copper sulphate.
134.	A transformer has at full-load iron loss of 900 watts and copper loss of 1,600 watts. At what % of the load transformer will have maximum efficiency?
	(1) 133%. (2) 125%. (3) 75%. (4) 66.6%.
135.	The efficiency of a 100 kva transformer is 0.98 at full as well as half load. For this transformer at full load the copper loss
	(1) is less than copper less.
	(2) is equal to core loss.
	(3) is more than core loss.
	(4) none of the above.

P_C, are put to back to back test and full load current is allowed to flow through the secondaries, the total input will be
(1) $2 P_i$
(2) $2 P_C$
(3) $P_i + P_C$

(4) $2(P_i + P_C)$

137. The voltage regulation of a transformer at full load and 0.8 power factor lagging is 2.5%. The voltage regulation at full load, 0.8 power factor leading will be
(1)   -2.5%
(2)   zero.
(3)   1.0%
(4)   2.5%.

138. A transformer can have zero regulation at
(1)   zero pf.
(2)   unity pf.
(3)   lagging pf.
(4)   leading pf.

139. A transformer has hysteresis loss of 30 W, at 240V, 60 Hz. The hysteresis loss at 200 V, 50 Hz will be
(1)   28 W.
(2)   25 W.
(3)   30 W.
(4)   36 W.

140. An SCR chopper circuit supplies power to a DC motor. What will be the nature of motor armature current?
(1)   sinusoidal.
(2)   exponential rise and decay.
(3)   constant.
(4)   none of the above

141. A single phase full convector is connected across 250 V AC. Its output voltage when firing angle is 30° is given by
(1)   210 V.
(2)   195 V.
(3)   250 V.
(4)   none of the above.

142. A DC chopper has a T_{ON} of 1 ms and its frequency is 500 Hz. What will be its duty cycle?
(1)   100%.
(2)   75%.
(3)   50%.
(4)   25%.

143. In a DC series motor, if armature current is reduced to 70% of its original value, the torque of the motor will be reduced by
(1)   49%.
(2)   51%.
(3)   50%.
(4)   70%.

144. If the applied voltage to a DC machine is 230V, then the back emf, for maximum power developed is

(1)   115 V.
(2)   200 V.
(3)   230 V.
(4)   460 V.

145. The direction of rotation of a DC shunt motor can be reversed by interchanging

(1)   the supply terminals.
(2)   the field terminals only.
(3)   the armature terminals only.
(4)   either field or armature terminals.

146.	A 220V DC machine has an armature resistance of 1Ω. If the full load current is 20A, the difference in the induced voltages when the machine is running as a motor, and as a generator is
	(1) 20 V.
	(2) Zero.
	(3) 40 V.
	(4) 50 V.
147.	At a certain speed and flux, the voltage generated by a DC generator is 230 volts. If the speed is increased by 20% and the flux is simultaneously reduced by 10%, the voltage will be
	(1) increased by 10%
	(2) reduced by 20%
	(3) increased by 8%.
	(4) decreased by 8%.
148.	A current of 5 ± 0.1 amp flows through a resistor $50 \pm 0.5\Omega$ calculate the limiting error in the value of power dissipated.
	(1) $\pm$ 30W.
	(2) $\pm$ 40 W.
	(3) $\pm$ 62.5 W
	(4) $\pm$ 50 W.
149.	The armature resistance of a 6-pole lap wound DC machine is 0.05 Ω. If the armature is re-wound using a wave winding, then the armature resistance will be
	(1) 0.45.
	(2) 0.30.
	(3) 0.15.
	(4) 0.10.
150.	The steady state current in the R-C series circuit, on the application of step voltage of magnitude E will be
	(1) zero
	(2) E/R.
	(3) $\dfrac{E}{R} e^{-t/RC}$
	(4) $\dfrac{E}{RC} e^{-t}$
151.	An inductor at $t = 0^{+}$ with initial current I_0 acts as
	(1) voltage source
	(2) current source.
	(3) open-circuit.
	(4) short-circuit.
152.	The voltages at the two ends of a line are 132 kV and its reactance is 40 Ω the capacity of the line is
	(1) 435.6 MW.
	(2) 217.5 MW.
	(3) 251.5 MW.
	(4) 500 MW.
153.	In a two wattmeter method of measuring power in a 3-phase system one of the wattmeters reads negative implying
	(1) wattmeter connection is faulty..
	(2) load is unbalanced.
	(3) power flow is in the reverse direction.
	(4) power factor is less than 0.5.
154.	If all the elements in a particular network are linear, then the superposition theorem would hold when the excitation is
	(1) DC only.
	(2) AC only.
	(3) either AC or DC.

155.	The dynamic resistance of a parallel resonant circuit is given by

(1) $\dfrac{LC}{R}$ (2) LCR (3) $\dfrac{C}{LR}$ (4) $\dfrac{L}{CR}$

156.	The quality factor of R-L-C circuit will increase if
	(1) R decreases.
	(2) R increases.
	(3) voltage increases.
	(4) L decreases.

157.	A circuit with a resistor, inductor and capacitor in series is resonant at f_0 Hz. If all the component values are now doubled, the new resonant frequency is
	(1) $2f_0$
	(2) still f_0
	(3) $f_0/4$
	(4) $f_0/2$

158.	A square wave is fed to an R-C circuit. Then
	(1) voltage across R is square and across C is not square.
	(2) voltage across C is square and across R is not square.
	(3) voltage across both R and C is square.
	(4) voltage across both R and C is not square.

159.	A single phase voltage controller has input voltage of 230 V, 50 Hz and a load of $R = 15\Omega$. For 6 cycles on and 4 cycles off, rms output voltage and p.f. are resepctively
	(1) 160 V, 0.8 lag.
	(2) 178.2 V, 0.775 lag.
	(3) 189 V, 0.775 lead.
	(4) 178.2 V, 0.8 lag.

160.	Which of the following site will be preferred for earthing?
	(1) clayey soil.
	(2) dry & rocky.
	(3) wet mashy ground.
	(4) damp and wet sand pit.

161.	A coil with a certain number of turns has a specified time constant. If the number of turns is doubled, its time constant would.
	(1) remain unaffected.
	(2) become doubled.
	(3) become four fold.
	(4) get halved.

162.	The energy stored in the magnetic field of a solenoid 30 cm long and 3 cm diameter wound with 1,000 turns of wire carrying current of 10 A is
	(1) 0.015 J.
	(2) 0.15 J.
	(3) 0.5 J.
	(4) 1.15 J.

163.	A 3ϕ, 11 kV, 5 MVA alternator has synchronous impedance of $(1+j10)\Omega$ per phase. Its excitation is such that the generated emf is 14 kV. If the alternator is connected to infinite bus bar, then the maximum output at the given excitation is
	(1) 15400 kW.
	(2) 8891.3 kW.
	(3) 8892.8 kW.
	(4) 5135 kW.

164.	Hysteresis loss is affected minimum by
	(1) frequency.
	(2) ambient temperature.
	(3) volume of material.
	(4) steinmetz hysteresis coefficient.

turn ratio $\dfrac{N_1}{N_2}$ is

(1)   4
(2)   2
(3)   1
(4)   0.5

166. The coils having self inductance of 10 mH and 15 mH and effective inductance to 40 mH, when connected in series aiding. What will be the equivalent inductance if we connect them in series opposing?

(1)   20 mH.
(2)   10 mH.
(3)   5 mH.
(4)   zero.

167. The principle of statically induced emf is utilized in

(1)   transformer.
(2)   motor.
(3)   generator.
(4)   battery.

168. The field at any point on the axis of a current carrying coil will be

(1)   perpendicular to the axis.
(2)   parallel to the axis.
(3)   at an angle of 45° with the axis.
(4)   zero.

169. A parallel plate capacitor with air dielectric is connected to a constant voltage source. The force between its plates is F. If the capacitor is immersed in a liquid of dielectric constant $\in$ without disconnecting it form the power supply, then the force between the plates would be

(1) $\in^2 F$
(2) $\in F$
(3) F
(4) $F/\in$

170. The number of $2\mu F$, 400 V capacitors needed to obtain a capacitance value of 1.5 μF rated for 1600 V is

(1)   12.
(2)   8.
(3)   6.
(4)   4.

171. When a charge is given to a conductor,

(1)   it distributes uniformly all over the surface.
(2)   it distributes uniformly all over the volume.
(3)   it distributes on the surface, inversely proportional to the radius of curvature.
(4)   it stays where it was placed.

172. In two parallel conducting plates, each of area A and having charge density ρ_s, the force of attraction between them will be

(1) $\dfrac{1}{2\in}\rho_s^2 A^3$.

(2) $\dfrac{E^2}{2\in}A$.

(3) $\dfrac{1}{2\in}\rho_s^2$.

(4) $\dfrac{1}{2}\rho_s^2$.

173.	For a quardupole electric potential varies as
	(1) r. (2) $\dfrac{1}{r}$. (3) $\dfrac{1}{r^2}$. (4) $\dfrac{1}{r^3}$.
174.	The relation between electric polarization and susceptibility indicates that the electric polarization is (1) independent of susceptibility. (2) inversely proportional to susceptibility. (3) proportional to square root of susceptibility. (4) proportional to susceptibility.
175.	Two positive charges, Q coulombs each are placed at points (0,0 0) and (2,2,0) while two negative charges, Q coulombs each in magnitude, are placed at points (0,2 0) and (2,0, 0). The electric field intensity at the point (1,1,0) is (1) zero. (2) $\dfrac{Q}{8\pi \in_0}$. (3) $\dfrac{Q}{4\pi \in_0}$. (4) $\dfrac{Q}{16\pi \in_0}$.
176.	The electric field intensity between the plates of a parallel plate condenser is E. Now if a dielectric of medium of dielectric constant $\in$ is introduced between the plates, the electric field intensity will become (1) $\in E$. (2) $E/\in$. (3) $\sqrt{\in E}$. (4) $\sqrt{E/\in}$.
177.	A three phase induction motor draws 1000 KVA at a power factor of 0.8 lag. A synchronous condenser is connected in parallel to draw an additional 750 KVA at 0.6 p.f. lead. The power factor of the total load supplied by the mains is (1) unity (2) 0.707 lag. (3) 0.707 lead. (4) zero.
178.	A battery is connected to a resistance causing a current of 0.5A in the circuit. The current drops to 0.4 A when an additional resistance of 5Ω is connected in series. The current will drop to 0.2A when the resistance is further increased by (1) 10 Ω. (2) 15 Ω. (3) 25 Ω. (4) 40 Ω.
179.	A moving iron voltmeter is connected across the voltage source whose instantaneous value is $v(t) = 5 + 10\cos(314t + 30°)$. The reading of the meter is (1) 15 V. (2) 5 V. (3) $\sqrt{125}\ V$. (4) $\sqrt{75}\ V$.
180.	Two wires A and B of the same material and length l and $2l$ have radius r and $2r$ respectively. The ratio of their specific resistance will be (1) 1:1. (2) 1:2. (3) 1:4. (4) 1:8.