DO NOT OPEN THIS BOOKLET UNTIL TOLD TO DO SO

Time Allowed : 90 Minutes
Total No. Questions: 120

Code- D20MX6ECLS01 (P-I)

Name of the Candidate (in capital letters):

Candidate’s Signature

Invigilator’s Signature

IMPORTANT:– Read the following instructions carefully. Do not mark answers on the question booklet, otherwise you may be debarred from the selection process.

1. Before commencing to answer, check that the Question Booklet has 120 questions. Each Question Booklet will be in different series (combination of booklet code no. and series). You must write correct Booklet Code No. and Question Booklet Series on your OMR Answer Sheet. Further check that there is no misprinting, overprinting and/or any other shortcoming in it. If there is any shortcoming in the question booklet, intimate the same to your room invigilator and take a fresh question booklet. No complaint in this regard shall be entertained at any later stage.

IMPORTANT NOTE: The OMR Answer Sheet will be evaluated with a combination of question booklet series and booklet code no. hence you must write correct question booklet series and booklet code no. Any mistake in filling any of them will lead to invalidation of your OMR Answer Sheet. Also in case of non filling of question booklet series and booklet code no. the OMR Answer Sheet will not be evaluated and its sole responsibility lies on the candidate.

2. There shall be negative marking. 1/3 mark will be deducted for wrong answer. Each question carries equal mark. Also refer OMR Sheet for detailed instruction.

3. Ask invigilator to sign on your admit card. If the same is not got signed by you, your candidature shall be liable to be rejected.

4. This is an objective type test in which each objective question is followed by four responses serialled (1) to (4). Your task is to choose the correct/best response and mark your response in the OMR Answer Sheet only as per the instructions given and NOT in the Question Booklet.

5. Use Blue/Black Ball Point Pen for all your work on the OMR Answer Sheet. The ovals on the OMR Answer Sheet are to be completely filled by Blue/Black Ball Point Pen only. ANSWERS ONCE GIVEN CAN NOT BE CHANGED.

6. DO NOT scribble or do rough work or make any stray marks on the Answer Sheet. DO NOT wrinkle or fold or staple it.

7. Use of Calculators, Slide rules, Mobiles, calculator watches or any such devices and any other study/reference material is NOT allowed inside the examination hall.

8. Rough Work is to be done in the blank space provided in the Question Booklet, not on the OMR Answer Sheet. No other paper will be allowed/provided for rough work.

9. Return the complete Question Booklet and OMR Answer Sheet to the invigilator on completion of the test. Do not take this Question Booklet or any part thereof or OMR Answer Sheet outside the examination room. Doing so is a punishable offence.

10. Take care that you mark only one answer for each question. If more than one answer is given by you for any question, the same will not be evaluated. Cutting/overwriting the answers are not allowed. Further question paper is bilingual (Hindi/English). In case of any variation in Hindi version, English version will be taken as final for evaluation purposes.

हिन्दी में अनुदेश अतिरिक्त पृष्ठ (Back cover) पर दिया गया है।
1. Given that.
   1. A is the brother of B
   2. C is the father of A
   3. D is the brother of E
   4. E is the daughter of B

   Then the uncle of ‘D’ is:
   (1) E  (2) B  (3) C  (4) A

2. Study the following figure:
   A person goes from A to B always moving to right or downwards along the lines. How many different routes he can adopt?

   A

   B

   Select the correct answer.
   (1) 5  (2) 4  (3) 6  (4) 7

DIRECTIONS: Given below are three positions of the same dice having names of six institutions inscribed on six faces. The names of these institutions are, ICA, ICWA, ICSI, ICFAI, IIT, BHU.

3. Which name occurs on the face opposite to that of ICA?
   (1) ICSI  (2) ICFAI  (3) IIT  (4) None of these

4. Bidhya Devi Bhandari’s is the?
   (1) First female President of Nepal
   (2) First female Prime Minister of Nepal
   (3) First female Vice President of Nepal
   (4) First female chief Justice of Nepal

5. The Gulf Stream is an ocean current which begins:
   (1) Off the coast of Florida
   (2) From the Bay of Bengal
   (3) Gulf countries coastline
   (4) In the Philippines

6. Who recently became 161st member of WTO?
   (1) Yemen  (2) Seychelles  (3) Tajikistan  (4) Ukraine

DIRECTIONS: In the following question a number series is given. After the series a number is given followed by (a), (b), (c), (d) and (e). You have to complete the series starting with the number given following the sequence of the given series and answer the question given below the series.

7. 3 4 16 75 364 1945
   1 (a) (b) (c) (d) (e)

   What will come in place of (c)
   (1) 63  (2) 64  (3) 65  (4) None of these
8. How many triangles are there in the given figure?

(1) 16  (2) 14  (3) 15  (4) None of these

9. A frog tries to come out of a dried well 9 m deep with slippery walls. Every time the frog jumps 60 cm, he slides back by 30 cm. How many jumps will the frog have to take to come out of the well?

(1) 20  (2) 29  (3) 30  (4) 31

10. How many minutes will it take to completely fill a water tank with a capacity of 3750 cu ft, if the water is being pumped at the rate of 800 cu ft per minute and being drained out of tank at the rate of 300 cu ft per minute:

(1) 3 minutes 36 seconds  (2) 6 minutes  (3) 7 minutes 30 seconds  (4) 8 minutes

11. Triangle ABC and triangle DEF are equilateral triangles with shaded portions of equal width throughout. If AB=4 and EF=2, Area of the shaded portion is:

(1) $4\sqrt{3}$  (2) $3\sqrt{3}$  (3) $\sqrt{3}$  (4) None of these

12. Which is next in series?

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

13. In a joint family of seven persons F, E, N, J, P, M and L, there are two married couples. F is a housewife and her husband is E. J is the wife of N. L is the granddaughter of F. E is the father in law of J and father of P. M is the son of N and brother of L. How is J related to P?

(1) Sister  (2) Sister in law  (3) Niece  (4) Cousin sister

DIRECTIONS: Answer the following question according to the instructions given.

A$B$ means A is not smaller than B
A#B means A is not greater than B
A@B means A is neither smaller nor equal to B
A*B means A is neither greater than nor smaller than B
A%B means A is neither greater than nor equal to B

14. STATEMENT:
M@J, J$T, T*N

CONCLUSION:
I. N#J  II. T%M  III. M@N

(1) Only I and II are true  (2) Only II is true  (3) Only I and III are true  (4) All are true

(SET-01) PAPER – I [517313]
**DIRECTIONS:** (Question no. 19 to 22) Read the information given and answer the questions based on it.

Seven boys namely Prashant, Rajesh, Salman, Tarun, Umar, Varun and Wasim go for tuitions to study different subjects namely Mathematics, Physics, Sociology, Chemistry, Biology, Economics and Accounts (not necessarily in the same order). Each student studies only one subject and each subject's tuition is only once a week. Two subjects cannot be taught in the same day. Also-

I. Prashant studies chemistry and goes on Sunday.
II. Umar goes for tuition on Friday.
III. The student who studies biology goes on Thursday.
IV. Rajesh goes on Monday.
V. Tarun goes on Wednesday but does not study Sociology.
VI. Varun and Wasim do not study economics.
VII. The student who studies economics goes on Tuesday.

### 19. Mathematics tuitions are on which day of the week?
- **(1) Wednesday**
- **(2) Saturday**
- **(3) Friday**
- **(4) Monday**

### 20. Umar studies which subject?
- **(1) Sociology**
- **(2) Accounts**
- **(3) Physics**
- **(4) Cannot be determined**

### 21. If Umar studies accounts then on which day is sociology tuition?
- **(1) Wednesday**
- **(2) Friday**
- **(3) Monday**
- **(4) Thursday**

### 22. If Rajesh studies sociology then Umar studies?
- **(1) Mathematics**
- **(2) Physics**
- **(3) Accounts**
- **(4) Cannot be determined**
23. A group of ten persons can do a particular task in 10 days. Another group can do the same job in 20 days. In how many days will the job be finished if the groups works together (each group does part of the task in proportion to its total ability):

1. \( \frac{5}{3} \)  
2. \( \frac{2}{3} \)  
3. \( 7 \frac{1}{3} \)  
4. \( 8 \frac{1}{2} \)  

24. In a certain code language LESSON is coded as NGUQML. How will PUZZLE be coded in that code language?

1. RWXBJP  
2. RVBXJC  
3. RWXJC  
4. RUBXJC  

25. In the given figure AB and CD are two parallel chords of a circle with center O and radius 5 cm. Also AB = 8 cm and CD = 6 cm. If OP \( \perp AB \) and OQ \( \perp CD \), determine the length of PQ:

1. 7 cm  
2. 10 cm  
3. 8 cm  
4. None of these

26. A well of inner diameter 14 m is dug to a depth of 15 m. Earth taken out of it has been evenly spread all around it to a width of 7 m to form an embankment. Find the height of embankment so formed:

1. 7 m  
2. 5 m  
3. 14 m  
4. None of these

27. Dr. APJ Abdul Kalam collapsed only 5 minutes into his lecture at IIM, Shillong. Name this lecture.

1. Creating a livable planet earth  
2. Ignited minds  
3. Forge your future  
4. Transforming dreams into actions

28. A hall 50 m long and 45 m broad is to be paved with square tiles. Find the largest tile as well as its number in the given options so that the tiles exactly fit in the hall:

1. 36 sq m and 80 tiles  
2. 16 sq m and 80 tiles  
3. 25 sq m and 90 tiles  
4. 36 sq m and 90 tiles

29. A metal cube of edge 12 cm is melted and formed into three smaller cubes. If the edges of two smaller cubes are 6 cm and 8 cm, find the edge of the third smaller cube:

1. 8 cm  
2. 10 cm  
3. 12 cm  
4. None of these

30. Silk Route–2015 is a:

1. Joint military training exercise between China & Sri Lanka  
2. A route defined for smuggling of gold between India & Dubai  
3. Silk trade agreement between India & Silk producing countries  
4. Anti terrorism agreement between SAARC countries

31. In a certain code language LESSON is coded as NGUQML. Kritishipkodh gam LESSON ki NGUQML ko dikhii karte hain. To uski kodha gam में PUZZLE को कैसे कोड करें?

1. RWXBJP  
2. RVBXJC  
3. RWXJC  
4. RUBXJC

32. A metal cube of side 12 cm is melted and formed into three smaller cubes. If the edges of two smaller cubes are 6 cm and 8 cm, find the edge of the third smaller cube:

1. 8 cm  
2. 10 cm  
3. 12 cm  
4. None of these

33. A group of ten persons can do a particular task in 10 days. Another group can do the same job in 20 days. In how many days will the job be finished if the groups works together (each group does part of the task in proportion to its total ability):

1. \( \frac{5}{3} \)  
2. \( \frac{2}{3} \)  
3. \( 7 \frac{1}{3} \)  
4. \( 8 \frac{1}{2} \)  

34. In a certain code language LESSON is coded as NGUQML. How will PUZZLE be coded in that code language?

1. RWXBJP  
2. RVBXJC  
3. RWXJC  
4. RUBXJC

35. Silk Route–2015 is a:

1. Joint military training exercise between China & Sri Lanka  
2. A route defined for smuggling of gold between India & Dubai  
3. Silk trade agreement between India & Silk producing countries  
4. Anti terrorism agreement between SAARC countries
31. Match the places to the state to which it belongs.

<table>
<thead>
<tr>
<th>STATE</th>
<th>PLACES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. West Bengal</td>
<td>1. Badrinath Temple</td>
</tr>
<tr>
<td>B. Tripura</td>
<td>2. Ujjayanta Palace</td>
</tr>
<tr>
<td>C. Uttarakhand</td>
<td>3. Hajo</td>
</tr>
<tr>
<td>D. Assam</td>
<td>4. Kalimpong</td>
</tr>
</tbody>
</table>

32. Match the following in the given sequence in context of memory:

- A. Very High Speed
- B. Non-Volatile & high storage
- C. External & cheaper
- D. Read only

<table>
<thead>
<tr>
<th>A1, B2, C3, D4</th>
<th>A1, B3, C4, D2</th>
<th>A1, B2, C4, D3</th>
<th>A1, B2, C1, D4</th>
</tr>
</thead>
</table>

33. The temples of Halebid and Belur were built by:

- Cholas
- Rashtrakutas
- Pallavas

34. The perimeters of a square and a regular hexagon are equal. The ratio of the area of the hexagon to the area of the square is:

- \(2\sqrt{3}:1\)
- \(2\sqrt{3}:3\)
- \(3\sqrt{3}:2\)
- \(\sqrt{3}:3\)

35. Which of the following ports of India is on the eastern Coast:

- Cochin
- Tuticorin
- Mumbai

36. Which of the following are included in the original jurisdiction of the Supreme Court?

1. A dispute between the Government of India and one or more states.
2. A dispute regarding elections to either house of the parliament or that of a legislative state.
3. A dispute between the Government of India and a union territory.
4. A dispute between two or more states.

Select the correct answers using the codes.

<table>
<thead>
<tr>
<th>1 &amp; 2</th>
<th>2 &amp; 3</th>
<th>3 &amp; 4</th>
<th>1, 2 &amp; 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

37. Two trains moving in opposite directions cross each other in 7.5 seconds. If the length of one train is 150 m, what is the length of the other train if the trains are travelling at 50 & 70 km per hour respectively:

<table>
<thead>
<tr>
<th>Length</th>
<th>Speed (km/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 m</td>
<td>100</td>
</tr>
<tr>
<td>150 m</td>
<td>150</td>
</tr>
<tr>
<td>125 m</td>
<td>200</td>
</tr>
</tbody>
</table>

38. Three pipes A, B, C can fill a tank from empty to full in 30 minutes, 20 minutes, and 10 minutes respectively. When the tank is empty, all three pipes are opened. A & C discharge chemical solution ‘Q’, ‘R’, ‘S’ respectively. What is the proportion of solution ‘S’ in the liquid in the tank after 3 minutes:

<table>
<thead>
<tr>
<th>Time</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 min</td>
<td>(\frac{6}{11})</td>
</tr>
</tbody>
</table>
39. Recently Government of India has constituted a committee under the chairmanship of Justice R.V. Easwar to look into?
(1) To look into the implementation of goods & service tax
(2) To look into the affairs of Physically challenged person
(3) To look into the affairs of Niti Aayog
(4) The simplification of provisions of income tax Act

40. Identify the odd one out (refer to National Sports Awards for 2014–15):
(1) Harbans Singh
(2) Sandeep Kumar
(3) Anoop Singh
(4) Naval Singh

41. 2022 Commonwealth Games will be hosted by:
(1) Durban
(2) Gold Coast
(3) Victoria
(4) Kingston

42. There are two clocks, both set to show 10 pm on 21st January 2010. One clock gains 2 minutes in an hour and the other clock loses 5 minutes in an hour. Then by how many minutes do the two clocks differ at 4 pm on 22nd January 2010?
(1) 126 minutes
(2) 136 minutes
(3) 96 minutes
(4) 106 minutes

43. A publisher sells copies of books to a retailer at ₹ 5 per copy but allows 25 copies to be counted as 24. If the retailer sells each of the 25 copies at ₹ 6, his profit % is:
(1) 20% (2) 24% (3) 25% (4) 40%

DIRECTIONS: (Question No. 44 & 45) Each question below is followed by two statements I and II. You are to determine whether the data given in the statement is sufficient for answering the question. You should use the data and your knowledge of mathematics to choose between the possible answers.
A. If the statement I alone is sufficient to answer the question but the statement II alone is not sufficient.
B. If the statement II alone is sufficient to answer the question but statement I alone is not sufficient.
C. If both statements I and II together are needed to answer the question.
D. If either the statement I alone or statement II alone is sufficient to answer the question.
E. If you cannot get the answer from statement I and II together but need even more data.

44. X, Y and Z are three consecutive odd number (not necessary in this order). What is the sum of these number?
I. The difference of Y & Z is 4
II. One third of X is 33
(1) A (2) B (3) C (4) D

45. What is the number?
I. 25% of that number is one fourth of that number
II. 3/4 of that number is less by 14 of that number.
(1) A (2) B (3) D (4) E
46. Impedance $Z$ is shown in fig:

(1) 29j ohm  (2) 9j ohm
(3) 19j ohm  (4) 39j ohm

47. For highest power gain, what configuration is used:
(1) CC  (2) CE
(3) CB  (4) CS

48. An SCR has...... PN junctions:
(1) Two  (2) Four
(3) Three  (4) One

49. A pole pitch in electrical machine is:
(1) Equal to 180° electrical
(2) Equal to 180° mechanical
(3) Less than 180° electrical
(4) Greater than 180° electrical

50. Which of the following compensator will increase the bandwidth of the system:
(1) Phase lag  (2) Phase lead
(3) Lag-lead  (4) None of these

51. To increase power transfer capability of a long transmission line, we should:
(1) Increase line resistance
(2) Increase transmission voltage
(3) Decrease line reactance
(4) Both (2) & (3)

52. The instantaneous voltage and current across a load is given by $v = 50 \sin (314 t - \pi/6)$ volts and $i = 10 \sin (314 t - \pi/2)$ amperes, respectively. The active power consumed by the load is:
(1) 500 watts  (2) 125 watts
(3) 1000 watts  (4) None of these

53. Drop in alternator frequency is corrected by:
(1) Damper winding
(2) Increased prime mover output
(3) Automatic voltage regulator
(4) None of these

54. In a galvanometer, the deflection becomes one half when the galvanometer is shunted by a 20 ohm resistor. The galvanometer resistance is:
(1) 5 ohm  (2) 10 ohm
(3) 40 ohm  (4) 20 ohm
55. In a three phase half wave rectifier feeding resistive load, if the input source is a three phase 4 wire system and line to line voltage is 100 V. The supply frequency is 400 Hz. The ripple frequency at the output is:
   (1) 400 Hz  (2) 800 Hz  (3) 1200 Hz  (4) None of these

56. Ripple in output current of a step-down chopper feeding RLE load is maximum, when duty cycle is equal to:
   (1) 1  (2) 0.5  (3) 0.75  (4) 0.33

57. Which of the following are constant losses in Transformers?
   (1) Winding losses  (2) Core losses  (3) Both Winding & core losses  (4) None of these

58. Deep bar rotor construction is used in three phase induction motors to mainly:
   (1) Control speed  (2) Control power factor  (3) Increase starting torque  (4) None of these

59. Two transformers with identical voltage ratings are working in parallel to supply common load. The percentage impedance of one transformer is higher compared to that of the other. The load sharing between the two transformer will:
   (1) Be proportional to their percentage impedance  (2) Be independent of their percentage impedance  (3) Be inversely proportional to their respective impedance  (4) Depend on the resistance to leakage reactance ratio of each transformer

60. Number of comparators required for an 8 bit flash ADC is:
   (1) 8  (2) 16  (3) 255

61. A 35 V dc supply is connected across a resistance of 600 ohm in series with an unknown resistance R. A voltmeter having a resistance of 1.2 kΩ is connected across 600 ohm resistances and reads 5 V. The value of resistance R shall be:
   (1) 1.2 kΩ  (2) 2.4 kΩ  (3) 120 kΩ  (4) 400 kΩ

62. A three phase slip ring induction motor is fed from the rotor side with stator winding short circuited stator is:
   (1) Slip frequency  (2) Supply frequency  (3) Frequency corresponding to rotor speed  (4) Zero

65. तीन तरंग दिशा में बिडग्गी संचालन प्रतिरोधी लोड में धर्म निषेध श्रेणी एक तीन तरंग दिशा प्रवाही और लोड में लोड जो बोतल 100 V है, आपूर्ति अवृत्त 400 Hz है। निम्न पर उपर्युक्त आवृत्ति है:
   (1) 400 Hz  (2) 800 Hz  (3) 1200 Hz  (4) इनमें से कोई नहीं

66. रिक्टर पॉल लोड को संचालन करने वाले अपरिमेरी चैपर के निम्न भाग में उपर्युक्त अवृत्ति निम्न के समान है?
   (1) 1  (2) 0.5  (3) 0.75  (4) 0.33

67. ट्रांसफॉर्मरों में धर्म में से कौनसी तत्त्व तत्त्व है?
   (1) वाइंडिंग तत्त्व  (2) कोर तत्त्व  (3) वाइंडिंग और कोर तत्त्व  (4) इनमें से कोई नहीं

68. बिडग्गी प्रेरण लोडों में गान-हलकाक रोटर निर्माण का प्रयोग मुख्यतः निम्न प्रयोगों से है?
   (1) छुड़क निर्माण करना  (2) गहरा गुणक निर्माण करना  (3) प्रभावी बल आपूर्ति करना  (4) इनमें से कोई नहीं

69. ट्रांसफॉर्मरों को प्राप्त प्रतिबाध प्रतिरोध के प्रति प्रतिरोध पर निर्भर करते हैं?
   (1) उनकी प्रतिबाध प्रतिबाध के अनुपातिक होगी  (2) उनकी प्रतिबाध प्रतिबाध में स्वतंत्र होगी  (3) उनकी प्रतिबाध प्रतिबाध के प्रति विस्तारप्रभित होगी  (4) प्रत्येक ट्रांसफॉर्मर की योग प्रतिबाध के प्रति प्रतिरोध पर निर्भर करते हैं

70. 8 बिट प्रैफ एडसे के लिए अपेक्षित तुलनाओं की संख्या है?
   (1) 8  (2) 16  (3) 255  (4) 256

71. 35 V dc तलपाई को अपवाद प्रतिरोध R के साथ श्रेणी में 600 ओम के प्रतिरोध के आर-पार संबंधित किया जाता है। 1.2 kΩ के प्रतिरोधों से युक्त एक बोल्टमीटर को 600 ओम प्रतिरोध से आर-पार संबंधित किया जाता है और उसका पठन 5 V है। प्रतिरोध R का मान होगा:
   (1) 1.2 kΩ  (2) 2.4 kΩ  (3) 120 kΩ  (4) 400 kΩ

72. एक बिडग्गी तरंग प्रेरण मोटर को रोटर की तरफ से संवर्धित किया जाता है जबकि टेरटर वाइंडिंग लघुप्रद केंद्र से युक्त है:
   (1) स्पीड आवृत्ति (2) आपूर्ति आवृत्ति (3) रोटर भाग के अनुप्रयोग आवृत्ति (4) शून्य
63. In the circuit given below, the value of R required for the transfer of maximum power to the load having a resistance of 3Ω will be?

![Circuit Diagram]

(1) 3 Ω  
(2) 10 Ω  
(3) 6 Ω  
(4) 9 Ω

64. In the following given circuit what will be the value of current i in the 5Ω resistor?

![Circuit Diagram]

(1) 5A  
(2) 4A  
(3) 2A  
(4) 0A

65. From source \( V_s = 200\cos\omega t \), a load draws current \( I_m \) = 2.5 at power factor 0.6 lagging. The load impedance is:

(1) 48+64j  
(2) 40 +50j  
(3) 30+64j  
(4) 48+ 50j

66. Two capacitor \( C_1 \) and \( C_2 \) have \( C_1=20\mu F \) and \( C_2=30\mu F \), are connected in parallel across a 100V source. The net capacitance of the circuit is?

(1) 50 \( \mu F \)  
(2) 10 \( \mu F \)  
(3) 12 \( \mu F \)  
(4) 60\mu \mu

67. Power-factor of industrial arc and induction furnace is:

(1) High lagging  
(2) High leading  
(3) Low lagging  
(4) Very low lagging

68. A 100mA meter has accuracy of \( \pm 2\% \). Its accuracy while reading 50mA will be:

(1) \( \pm 1\% \)  
(2) \( \pm 2\% \)  
(3) \( \pm 4\% \)  
(4) \( \pm 20\% \)

69. A series inductor is normally added in a thyristor circuit for achieving protection against:

(1) High current  
(2) High voltage  
(3) High dv/dt  
(4) High dv/dt

70. Clamp on ammeter is used for measurement of:

(1) Large alternating currents  
(2) Small direct currents  
(3) Small alternating currents  
(4) Large direct currents
71. Consider the following statements:
Over head transmission lines are provided with earth wires:
1. To protect the transmission line from direct lightning strike
2. To protect the transmission line insulation from the indirect lightning strike
3. To balance the line currents
4. To provide path for neutral current
Which of these statement/s is/are correct?
(1) 1 and 3 (2) 1 and 4 (3) 1 only (4) 2 only

72. An ammeter has a current range of 0–5 A, and its internal resistance is 0.2Ω. In order to change the range to 0–25 A, what should be the value of resistance added and how it would connect with meter (i.e. series/parallel)?
(1) (0.05Ω/series) (2) (0.05Ω/parallel) (3) (0.20Ω/parallel) (4) (0.20Ω/series)

73. Power consumed by a balanced 3-phase, 3-wire load is measured by two wattmeter method. The first wattmeter reads twice that of the second. Then what will be the load impedance angle in radian?
(1) (π/6) (2) (π/3) (3) (π/2) (4) (π/4)

74. The X/R ratio for distribution lines is:
(1) Less than unity (2) More than unity (3) Equal to unity (4) None of these is necessary

75. Corona loss is minimum in:
(1) Monopolar HVDC line (2) Bipolar HVDC line (3) Both in Monopolar& Bipolar HVDC lines (4) EHV AC lines

76. The potential transformers’ Nominal Ratio is defined as the ratio of:
(1) Primary winding voltage and secondary winding voltage (2) Rated primary winding voltage and rated secondary winding voltage (3) Primary winding turns and secondary winding turns (4) Any of the above

77. Whenever a 3-phase fault takes place at the terminals of an induction generator, the sustained fault current is:
(1) Equal to the full load current (2) About 20 times the full load current (3) Much less than full load current (4) About 10 times the full load current

78. For complete protection of a 3-phase line:
(1) Three phase and three-earth fault relays are required (2) Three phase and two-earth fault relays are required (3) Two phase and two-earth fault relays are required (4) Two phase and one-earth fault relays are required

79. निम्न कथनों पर विचार करें:
सिरोपर संचार लाइनों को धू-धार उपयोग कराए जाते हैं:
1. संचार लाइनों की प्रवन्ध ताढ़ी प्रभार से बचाना
2. संचार लाइन विद्युत उत्पादक को परवर पान्डा प्रभार से बचाना
3. लाइन धाराओं की विस्तृति रखना
4. उदरसीन धारा के लिए मूल उपयोग करना
इमें से कौन सी कथन सही है?
(1) 1 और 3 (2) 1 और 4 (3) केवल 1 (4) केवल 2

80. एक ऐंडेक्स 0–5 A की धारा रेत से युक्त है और इसका आंतरिक प्रतिरोध 0.2Ω है। रेत को 0–25 A को धारा के लिए जोड़े जाने वाले प्रतिरोध का मूल क्षण होना चाहिए। तब इस धारा के साथ कैसे (बैनली/सामान्य) संयोजित किया जाएगा?
(1) (0.05Ω/series) (2) (0.05Ω/parallel) (3) (0.20Ω/parallel) (4) (0.20Ω/series)

81. एक संयुक्त बिकल्प, 3 धारा लॉड को दो बादत्रीले विषि से भाग जाता है। पहले लॉड का उदर दूरसे से घुमा होता है। तब लॉड प्रतिवादाके कोण रैखिकता में क्या होगा?
(1) (π/6) (2) (π/3) (3) (π/2) (4) (π/4)

82. विरुद्ध लाइनों के लिए X/R अनुपात होता है:
(1) इमें से अधिक (2) इमें से अधिक (3) इमें से कोई भी जरूरी नहीं है (4) इमें से कोई भी जरूरी नहीं है

83. कोएरण लाइनों के लिए निम्न में बुधतम बनाई होती है:
(1) एक्सयूजी एचडीसी लाइन (2) दिक्सियूजी एचडीसी लाइन (3) एक्सयूजी तथा दिक्सियूजी दोनों एचडीसी लाइन (4) एचडीसी लाइन

84. विषय ट्रांसफॉर्मर अंशित अनुपात को निम्न के अनुपात के स्पेक्ट्रूम पर बिकल्पित किया जाता है:
(1) प्रामाण्य वाइंडिंग बोल्टला और दिक्सियूजी वाइंडिंग बोल्टला (2) सामान्य प्रामाण्य वाइंडिंग बोल्टला और सामानेकिरक दिक्सियूजी वाइंडिंग बोल्टला (3) प्रामाण्य वाइंडिंग फोर और दिक्सियूजी वाइंडिंग फोर (4) उपर्युक्त से कोई भी एक

85. प्रेरण जनरेटर के दमकोत्स पर जब कभी बिकल्प विकार उत्पन्न होता है अलगा विकार बनाई है:
(1) पूरी लॉड धारा के बाक़ी (2) पूरी लॉड धारा के लगभग 20 गूँडा (3) पूरी लॉड धारा से कौनसी क्षण (4) पूरी लॉड धारा के लगभग 10 गूँडा

86. बिकल्प लाइन की यूतु सुसंग्रह के लिए:
(1) बिकल्प और तीन - यूतु रिल की जस्ता होती है (2) बिकल्प और दो - यूतु रिल की जस्ता होती है (3) बिकल्प और दो - यूतु रिल की जस्ता होती है (4) बिकल्प और एक - यूतु रिल की जस्ता होती है
79. When two transformers of different kVA rating are connected in parallel they share the load in proportion to their respective kVA rating only when their:
(1) KVA rating are identical
(2) Efficiencies are equal
(3) P u impedance are equal
(4) Equivalent impedance are equal

80. The most efficient torque – producing actuating structure for induction – type relay is:
(1) Shaded pole structure
(2) Watt – hour – meter structure
(3) Induction – cup structure
(4) Single – induction loop structure

81. Triac are usually operated at:
(1) All frequencies
(2) High frequency only
(3) Power frequency
(4) None of these

82. Earth wire on EHV overhead transmission line is provided to protect the line against:
(1) Lightning surge
(2) Switching surge
(3) Excessive fault voltage
(4) Corona effect

83. The measurement range of an ammeter can be increased by using a:
(1) High resistance in shunt
(2) Low resistance in shunt
(3) High resistance in series
(4) Low resistance in series

84. Three equal resistors, connected in series across a source of emf, dissipated 10W of power. What would be the power dissipated in the same resistor when they are connected in parallel across the same source?
(1) 10W
(2) 30W
(3) 90W
(4) 270W

85. If a 3-pahse, 400V, 50Hz, 4 pole induction motor is running at a slip of 5% then the relative speed of rotor field with respect to stator filed is:
(1) Zero
(2) 75 rpm
(3) 142.5 rpm
(4) 1500 rpm

86. A 3-phase induction motor is running at slip ‘s’. If its two supply leads are interchanged, then the operating slip at that instant will be:
(1) 2s
(2) (1-s)
(3) (2-s)
(4) Zero

87. In a 3-phase voltage source inverter used for speed control of induction motor, anti-parallel diodes are used across each switching device. The main purpose of diodes is to:
(1) Protect the switching devices against over voltage
(2) Provide path for freewheeling current
(3) Allow the motor to return energy during regeneration
(4) Help in switching off the devices
88. Skewing of rotor bars eliminate the:
(1) Effect of space harmonics
(2) Entire effect of crawling
(3) Magnetic noise
(4) Vibration due to unequal force developed on rotor

89. Out of the followings, which one is correct in case of a circuit breaker?
(1) Making capacity = 2.55 $\times$ braking capacity
(2) Braking capacity = 2.55 $\times$ making capacity
(3) Making capacity = 1.8 $\times$ braking capacity
(4) Braking capacity = 1.8 $\times$ making capacity

90. The steady-state fault current during a 3 phase terminal fault on a generator is limited by:
(1) Transient reactance of the generator
(2) Sub-transient reactance of the generator
(3) Synchronous reactance of the generator
(4) DC off-set during the instant of the fault

91. A 3-phase delta connected squirrel cage induction motor when started with a DOL starter has a starting torque of 600 NM. Its starting torque when star delta starter is used:
(1) 600 NM
(2) 200 NM
(3) 300 NM
(4) 1200 NM

92. Making current of a circuit breaker refers to:
(1) Steady state rated current
(2) Average value of transient short circuit current
(3) R.M.S. value of the short circuit current at the time of major peak
(4) Equal to the fault current

93. In case of a ‘High Voltage DC’ transmission, how many minimum conductors are required?
(1) One
(2) Two
(3) Three
(4) Four

94. Which of the following motor has squirrel cage winding on the stator:
(1) 3 phase squirrel cage induction motor
(2) Single phase squirrel cage pump motor
(3) Single phase ceiling fan induction motor
(4) Single phase table fan induction motor

95. In order to switch-off and EHV circuit for maintenance, the following sequence is adopted:
(1) Open the circuit breaker, open the isolator, operate the earth switch
(2) Operate the earth switch, open the isolator, open the circuit breaker
(3) Open the isolator, operate the earth switch, open the circuit breaker
(4) Open the isolator, open the circuit breaker, operate the earth switch

96. A 3-phase delta connected squirrel cage induction motor when started with a DOL starter has a starting torque of 600 NM. Its starting torque when star delta starter is used:
(1) 600 NM
(2) 200 NM
(3) 300 NM
(4) 1200 NM

97. Making current of a circuit breaker refers to:
(1) Steady state rated current
(2) Average value of transient short circuit current
(3) R.M.S. value of the short circuit current at the time of major peak
(4) Equal to the fault current

98. In case of a ‘High Voltage DC’ transmission, how many minimum conductors are required?
(1) One
(2) Two
(3) Three
(4) Four

99. Which of the following motor has squirrel cage winding on the stator:
(1) 3 phase squirrel cage induction motor
(2) Single phase squirrel cage pump motor
(3) Single phase ceiling fan induction motor
(4) Single phase table fan induction motor

100. In order to switch-off and EHV circuit for maintenance, the following sequence is adopted:
(1) Open the circuit breaker, open the isolator, operate the earth switch
(2) Operate the earth switch, open the isolator, open the circuit breaker
(3) Open the isolator, operate the earth switch, open the circuit breaker
(4) Open the isolator, open the circuit breaker, operate the earth switch
96. For the circuit given in the fig, the thevenin's voltage and resistance as seen at AB are represented by:

(1) 5 V, 10 Ω  
(2) 10V, 10 Ω  
(3) 5 V, 5 Ω  
(4) 54V, 15 Ω

97. Why are shunt reactors connected at the receiving end of long transmission line system:

(1) To increase the terminal voltage  
(2) To compensate voltage rise caused by capacitive charging at light load  
(3) To improve power factor  
(4) None of these

98. A 10Ω resistor is connected in parallel with a 15Ω resistor and the combination in series with a 12Ω resistor. The equivalent resistance of the circuit is:

(1) 37Ω  
(2) 27Ω  
(3) 18Ω  
(4) None of these

99. A nickel coil has a resistance of 13Ω at 50°C. If the temperature coefficient of resistance at 0°C is 0.006/°C, the resistance at 0°C is:

(1) 16.9Ω  
(2) 10Ω  
(3) 43.3Ω  
(4) None of these

100. The energy used by a 1.5kW heater in 5 minutes is:

(1) 450 000 J  
(2) 450 J  
(3) 7500 J  
(4) None of these

101. What is called the Electro-Motive Force (EMF) of a voltage source?

(1) Terminal voltage when load is applied  
(2) Internal voltage when no load is applied  
(3) Product of internal resistance and load current  
(4) Electric pressure provided to the load

102. A permanent magnet moving coil ammeter has a coil resistance of 99 ohm and Full Scale Deflection (FSD) current of 0.1mA. Shunt resistance is 1 ohm. Current through the meter at 0.5 F.S.D is:

(1) 0.007mA  
(2) 0.05mA  
(3) 0.023mA  
(4) None of these

103. For power measurement of three phase circuit by two wattmeter method, when the value of power factor is less than 0.5 lagging:

(1) One of the wattmeters will read zero  
(2) Both give the same readings  
(3) One of the wattmeter connections will have to be reversed  
(4) Pressure coil of the wattmeter will become ineffective
104. Find the node voltage $V_A$:

![Circuit Diagram]

(1) 6 V  (2) 12 V  (3) 4.25 V  (4) None of these

105. One international ohm is equal to:

(1) 1.00049 absolute ohm  
(2) 0.99951 absolute ohm  
(3) 0.969 absolute ohm  
(4) 1.049 absolute ohm

106. In a uniform electric field, field lines and equipotentials:

(1) Are parallel to one another  
(2) Intersect at 45°  
(3) Intersect at 30°  
(4) Are orthogonal

107. During forward blocking state, the SCR has:

(1) Low current, medium voltage  
(2) Low current, large voltage  
(3) Medium current, large voltage  
(4) Large current, low voltage

108. Turn on time of an SCR can be reduced by using a:

(1) Rectangular pulse of high amplitude and narrow width  
(2) Rectangular pulse of low amplitude and wide width  
(3) Triangular pulse  
(4) Trapezoidal pulse

109. The disruptive critical voltage will:

(1) Decrease with the increase of moisture content in air  
(2) Increase with the increase of moisture content in air  
(3) Increase with the decrease of moisture content in air  
(4) Decrease with the decrease of moisture content in air

110. What type of insulator will be used if the direction of the transmission line is to be changed?

(1) Pin-type  
(2) Suspension type  
(3) Strain type  
(4) Shakle type

111. Which statement is correct:

(1) $\text{SF}_6$ gas is toxic  
(2) $\text{SF}_6$ gas is lighter than air  
(3) $\text{SF}_6$ gas is yellow in colour  
(4) $\text{SF}_6$ gas has pungent smell

112. One coulomb of electrical charge is contributed by how many electrons?

(1) $0.625 \times 10^{19}$  
(2) $1.6 \times 10^{19}$  
(3) $10^{19}$  
(4) None of these
113. A dynamic system with input \( x(t) \) and output \( y(t) \) is represented by the following:

(1) \( y(t) = f(x(t), t) \)
(2) \( y(t) = ax(t) + bx^2(t) \)
(3) \( y(t) = a \sin(t) \)
(4) None of these

114. Three equal resistors each equal to \( R \) ohm are connected as shown in fig. The equivalent resistance between points A and B is:

(1) \( R \)
(2) \( 3R \)
(3) \( R/3 \)
(4) \( 2R/3 \)

115. The time constant of the circuit shown in fig. is:

(1) \( RC/3 \)
(2) \( 4RC/3 \)
(3) \( 2RC/3 \)
(4) \( 8RC/3 \)

116. If the current in the armature of d.c series motor is reduced to 5%, the torque of the motor will become:

(1) 50% of the previous value
(2) 25% of the previous value
(3) 150% of the previous value
(4) 125% of the previous value

117. If the excitation of an alternator operating in parallel with other alternators decreased, its:

(1) Power factor becomes more leading
(2) Output Kw will change
(3) Power factor becomes more lagging
(4) Power factor becomes unity

118. The output signal of a common-collector amplifier always:

(1) Larger than the input signal
(2) In phase with the input signal
(3) Out of phase with the input signal
(4) Exactly equal to the input signal

119. A current is said to be alternating when it changes in:

(1) Magnitude
(2) Direction
(3) Both magnitude and direction
(4) None of these

120. Hysteresis loss in a transformer depends upon:

(1) Frequency
(2) Supply voltage
(3) Square of the frequency alone
(4) Square of the voltage alone
प्रकाशित दिवाली के लिए उत्तम आधार का अनुकरण होता है। प्रत्येक प्रकाश के अंतर्गत समझ जानकारी के लिए उत्तर प्रकाश का अंशों करें।

1. अपना उत्तर लिखित प्रारंभ करने से पहले अपनी प्रत्यक्ष पुस्तक की हाली-मौत अंच पर ले, जिसे लेकर तो यह 120 प्रश्न है। प्रत्येक प्रत्यक्ष पुस्तक की सीखी निर्देश प्रारंभ होगी (प्रत्यक्ष पुस्तक कोड संख्या तथा प्रत्यक्ष पुस्तक का संख्या तथा)। आपके OMR उत्तर पत्तियों पर सीधे प्रत्यक्ष पुस्तक का संख्या तथा प्रत्यक्ष पुस्तक कोड संख्या लिखित है। पुनः यह भी परमाणु है कि इसमें विभिन्न सेवाओं अथवा अन्य विशेष मानकों की कोई कमी नहीं है। यदि किसी प्रकाश की कोई कमी हो तो पत्तियों को सुधारित करें और प्रत्यक्ष पुस्तक कोड का नया पत्ती प्रारंभ करें। इस संदर्भ में किसी भी प्रकाश की कोई विषय तथा यह विषय प्रारंभ करने पर यह नहीं तय किया जाएगा।

महत्त्वपूर्ण नोट: जो एम.एस.एफ. उत्तर पत्तियों के प्रत्यक्ष पुस्तक संख्या तथा प्रत्यक्ष पुस्तक कोड संख्या के संबंध में फूट होती है। अतः आपके ऑ.एम.एफ. उत्तर पत्तियों पर सीधे प्रत्यक्ष पुस्तक संख्या तथा प्रत्यक्ष पुस्तक कोड संख्या लिखित नहीं है। इसमें से किसी एक में भी गलती होने पर आपकी ऑ.एम.एफ. उत्तर पत्तियों निरस्त हो सकती है। ऑ.एम.एफ. उत्तर पत्तियों में प्रत्यक्ष पुस्तक कोड संख्या तथा प्रत्यक्ष पुस्तक का संख्या नहीं भरने पर अंशों के उत्तर पत्तियों का मूल्य नहीं किया जाएगा जिसकी विशेषता उत्तर पत्तियों की होगी।

2. गलत उत्तर के लिए 1/3 फ़ाइल अंक लगाया। प्रत्येक प्रश्न के अंतर्गत समझ जानकारी के लिए उत्तर प्रकाश का अनुकरण करें।

3. वाक्य-विशेषक से अपने वेब-पेज पर इस्तेमाल करें। परिणाम आपके अंक पर रहे तो आपकी पत्ती रह कर दी जाएगी।

4. यह एक वाक्य अंक क्रम की परिधि है जिसमें प्रत्येक प्रकाश के नीचे क्रम (1) से (4) तक चार प्रतिवेदित-उत्तर दिए है। आपके विकार में जो भी आप स्वीकार करते हैं उसके ऑ.एम.एफ. उत्तर पत्तियों में स्पष्ट लिखे। अपने उत्तर प्रत्यक्ष पुस्तक में न लगाए।

5. ऑ.एम.एफ. उत्तर पत्तियों पर सभी कार्यों के लिए नीले/काले बॉयेल पेंस से लिखें। ऑ.एम.एफ. उत्तर पत्तियों पर अंकल की पूर्ण श्रेणी से केवल नीले/काले बॉयेल पेंस से भरें। एक बार एक उत्तर का बदला नहीं या सकता।

6. उत्तर-पत्र पर न तो रूप कार्य करें न ही और किसी प्रकाश का निर्देश आदि लगाए या इसे नोट करें।

7. कंप्यूटर, स्लाइडेशन, मेमोरी, कंप्यूटर बॉडीया या इस प्रकाश की कोई भी दृष्टि अथवा विशेष अनुभव सहित विशेष अनुभव को प्रयोग परिधि में लिखित है।

8. रूप कार्य पुस्तक में किसी भी प्रकाश स्थान में लिखा जाना चाहिए, जो ऑ.एम.एफ. उत्तर पत्तियों पर कोई भी सूचना करें। किसी अन्य कारण पर इसे करने की अनुमति नहीं है।

9. पत्तियों की समस्त अथवा प्रत्यक्ष पुस्तक तथा उत्तर-पत्तियों प्रत्यक्ष पुस्तक को अपने पद करे। प्रत्यक्ष पुस्तक तथा इसका मात्र अथवा OMR उत्तर पत्तियों को परिधि का अंत से बाहर ले जाना चाहिए वहाँ किया कारण का प्रमाण अभाव है।

10. हर एक प्रश्न के कारण एक दो उत्तर होते हैं। एक से अन्यक प्रश्न पत्रों पर प्रश्न का कोई भी नहीं दिया जाएगा। उल्लम्ब में कोई भी क्रिया या अवस्थानंतर कारण को अनेक नहीं होगी। पुनः प्रत्येक पत्र विभाजन (हिंदी एवं अंग्रेजी) में है। हिंदी संस्करण में किसी भी पत्तियों होने पर मूल्यांकन के लिए अंकों संस्करण को अनेक माना जाएगा।

कुछ कार्य के लिए