

Test Date	22/02/2026
Test Time	5:00 PM - 7:00 PM
Subject	Junior Engineer Electrical Mechanical

Section : **General Awareness**

Q.1 Which of the following countries hosted the 2025 Asia Cup (cricket) in September 2025?

- Ans**
- ☒ 1. United Arab Emirates
 - ☐ 2. Sri Lanka
 - ☐ 3. India
 - ☐ 4. Pakistan

Q.2 What is the primary role of a commercial bank?

- Ans**
- ☒ 1. Accept deposits and lend to the public
 - ☐ 2. Regulate the stock market
 - ☐ 3. Issue currency
 - ☐ 4. Control government revenue

Q.3 Which major administrative change followed the suppression of the Revolt of 1857?

- Ans**
- ☐ 1. Establishment of Provincial assemblies
 - ☐ 2. Reduction in taxes by the East India Company
 - ☒ 3. Establishment of the British Crown rule
 - ☐ 4. Expansion of the East India Company

Q.4 The Royal Gold Medal and the Pritzker Architecture Prize winner, Balkrishna Doshi has been awarded which of the following awards in 2023?

- Ans**
- ☐ 1. Padma Shri
 - ☐ 2. Bharat Ratna
 - ☐ 3. Padma Bhushan
 - ☒ 4. Padma Vibhushan

Q.5 Which among the following chemicals is commonly used in the kitchen for cooking?

- Ans**
- ☐ 1. Ammonium chloride
 - ☐ 2. Nitric acid
 - ☒ 3. Sodium hydrogencarbonate
 - ☐ 4. Sulphuric acid

Q.6 Which of the following lies to the west of the western coastal plain of India?

- Ans**
- ☐ 1. Bay of Bengal
 - ☐ 2. Andaman Sea
 - ☐ 3. Laccadive Sea
 - ☒ 4. Arabian Sea

Q.7 Which of the following schemes was launched in October 2025 to modernize 1,000 Industrial Training Institutes (ITIs) under a hub-and-spoke model in India?

- Ans**
- ☐ 1. PM Kaushal Vikas Yojana
 - ☐ 2. National Career Service
 - ☒ 3. PM-SETU Scheme
 - ☐ 4. Skill India Mission

Q.8 Which veteran Kannada theatre artist and filmmaker passed away on 29 September 2025?

- Ans**
- ☐ 1. S.S. Stanley
 - ☐ 2. K. Viswanath
 - ☐ 3. Guru Prasad
 - ☒ 4. Yashwant Sardeshpande

Q.9 Which of the following was a British policy of annexing states that increased resentment before 1857?

- Ans**
- ☒ 1. Doctrine of Lapse
 - ☐ 2. Permanent Settlement
 - ☐ 3. Ryotwari System
 - ☐ 4. Subsidiary Alliance

Q.10 Which of the following wind systems brings the heavy summer rainfall to most of India?

- Ans**
- ☒ 1. Southwest monsoon winds
 - ☐ 2. Polar easterlies
 - ☐ 3. Continental trade winds
 - ☐ 4. Western disturbances

Q.11 Which of the following Articles of the Indian Constitution directs the State to organize Village Panchayats?

- Ans**
- ☐ 1. Article 45
 - ☐ 2. Article 38
 - ☐ 3. Article 46
 - ☒ 4. Article 40

Q.12 In which of the following states of India are the 'Gaddi' and 'Gujjar' tribes found?

- Ans**
- ☒ 1. Himachal Pradesh
 - ☐ 2. Tamil Nadu
 - ☐ 3. Rajasthan
 - ☐ 4. Odisha

Q.13 Which of the following statements is true with regard to the role of the private and public sectors in industrial development prior to 1991 in India?

- Ans**
- ☐ 1. Public sector was expected to complement the private sector.
 - ☐ 2. Both public and private sectors were expected to function competitively.
 - ☒ 3. Private sector was expected to complement the public sector.
 - ☐ 4. Public sector was expected to function as supplementary to the private sector.

Q.14 The energy consumption by a 60-W bulb which is kept on for 4 hours is _____.

- Ans**
- ☐ 1. 8.64×10^3 J
 - ☐ 2. 8.64×10^4 J
 - ☐ 3. 8.64×10^6 J
 - ☒ 4. 8.64×10^5 J

Q.15 Which of the following monuments is widely recognised as a Mughal mausoleum built by Shah Jahan?

- Ans**
- ☐ 1. Red Fort
 - ☐ 2. Qutub Minar
 - ☒ 3. Taj Mahal
 - ☐ 4. Humayun's Tomb

Q.16 Bharti Airtel announced a partnership in October 2025 to expand its cloud services. Which company did it partner with?

- Ans**
- ☐ 1. Microsoft
 - ☒ 2. IBM
 - ☐ 3. Amazon Web Services (AWS)
 - ☐ 4. Oracle

Q.17 Who among the following is considered the constitutional head of the Union Government?

- Ans**
- ☐ 1. Lok Sabha Speaker
 - ☐ 2. Prime Minister of India
 - ☐ 3. Vice President of India
 - ☒ 4. President of India

Q.18 Which of the following satellites was launched by the Indian Space Research Organisation (ISRO) in November 2025 using India's LVM3 launch vehicle?

- Ans**
- ☐ 1. NISAR
 - ☒ 2. CMS-03
 - ☐ 3. NVS-02
 - ☐ 4. Aditya-L2

Q.19 Which of the following was an administrative division under the Guptas that corresponded roughly to a district?

- Ans**
- ☐ 1. Grama
 - ☒ 2. Vishaya
 - ☐ 3. Pura
 - ☐ 4. Subah

Q.20 Which of the following Directive Principles of State Policy was added by the 42nd Amendment of the Indian Constitution?

- Ans**
- ☐ 1. Uniform civil code for the citizens
 - ☐ 2. Organization of village panchayats
 - ☒ 3. Equal justice and free legal aid
 - ☐ 4. Equal pay for equal work for both men and women

Section : **General Intelligence and Reasoning Ability**

Q.1 The position(s) of how many letters will remain unchanged if each letter in the word WHISTLE is arranged in alphabetical order?

- Ans**
- ☐ 1. 1
 - ☐ 2. 4
 - ☒ 3. 2
 - ☐ 4. 3

Q.2 A, E, Q, S, X, W and Z are sitting around a circular table facing the centre. W is an immediate neighbour of both E and X. X sits third to the left of Z. A sits to the immediate left of Z. S is not an immediate neighbour of X. How many people sit between S and W when counted from the left of S?

- Ans**
- ☐ 1. 1
 - ☐ 2. 3
 - ☐ 3. 2
 - ☒ 4. 4

Q.3 What will come in the place of '?' in the following equation, if '+' and 'x' are interchanged and '-' and '÷' are interchanged?
 $21+14-7\times 1\div 31 = ?$

- Ans**
- ☒ 1. 12
 - ☐ 2. 22
 - ☐ 3. -8
 - ☐ 4. 2

Q.4 Each vowel in the word ACETYLS is changed to the letter immediately following it in the English alphabetical order and each consonant is changed to the letter immediately preceding it in the English alphabetical order. How many letters will appear exactly twice in the group of letters thus formed?

- Ans**
-  1. 2
 -  2. 3
 -  3. 1
 -  4. 0

Q.5 Select the triad which follows the same pattern as that followed by the two triads given below. Both triads follow the same pattern.
EL-GN-IK
CJ-EL-GI

- Ans**
-  1. AH-CJ-EF
 -  2. BH-CI-EF
 -  3. AH-CJ-EG
 -  4. BH-CJ-EF

Q.6 What should come in place of ? in the given series based on the English alphabetical order?
BEJ FIN JMR NQV ?

- Ans**
-  1. RVY
 -  2. RUY
 -  3. RUZ
 -  4. RVZ

Q.7 Based on the English alphabetical order, three of the following four letter cluster pairs are alike in a certain way and thus form a group. Which is the one that does not belong to that group?
(Note: The odd man out is not based on the number of consonants/vowels or their position in the letter cluster)

- Ans**
-  1. GJ – LM
 -  2. SV – XZ
 -  3. LO – QR
 -  4. PS – UV

Q.8 In a certain code language,

A @ B means 'A is the daughter of B',
A # B means 'A is the brother of B',
A \$ B means 'A is the wife of B' and
A % B means 'A is the father of B'.

Based on the above, how is Jatin related to Disha if 'Jatin @ Naina % Karan \$ Piyush # Disha'?

- Ans**
-  1. Brother's wife's mother
 -  2. Wife's mother
 -  3. Brother's wife's sister
 -  4. Wife's sister

Q.9 What should come in place of ? in the given series based on the English alphabetical order?
EHC ILG MPK QTO ?

- Ans**
-  1. UXS
 -  2. UXR
 -  3. UYR
 -  4. UYS

Q.10 214 is related to 430 following a certain logic. Following the same logic, 242 is related to 486. To which of the following is 253 related, following the same logic?
(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g. 13 – Operations on 13 such as adding /subtracting /multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

- Ans**
- ☒ 1. 508
 - ☐ 2. 507
 - ☐ 3. 506
 - ☐ 4. 509

Q.11 Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which is the one that does not belong to that group?
(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter cluster.)

- Ans**
- ☐ 1. MTQ
 - ☒ 2. RXV
 - ☐ 3. PWT
 - ☐ 4. BIF

Q.12 Sara ranked 94th from the top and 52nd from the bottom in her class. How many students are there in her class?

- Ans**
- ☐ 1. 144
 - ☒ 2. 145
 - ☐ 3. 147
 - ☐ 4. 146

Q.13 Refer to the following letter series and answer the question. Counting to be done from left to right only.
(Left) M U Y R A N V H I T H U Q I X I L A V I S H U I O D H (Right)
How many such consonants are there each of which is immediately preceded by a vowel and also immediately followed by a consonant?

- Ans**
- ☐ 1. Three
 - ☐ 2. Two
 - ☐ 3. One
 - ☒ 4. More than three

Q.14 Select the pair which follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.
DEC–GHF
PQO–STR

- Ans**
- ☐ 1. UVT–WYV
 - ☒ 2. UVT–XYW
 - ☐ 3. UUR–WXV
 - ☐ 4. UUR–XYW

Q.15 Select the option that is related to the fifth number in the same way as the second number is related to the first number and the fourth number is related to the third number.
25: 225 :: 35 : 315 :: 45 : ?

- Ans**
- ☐ 1. 435
 - ☐ 2. 450
 - ☐ 3. 425
 - ☒ 4. 405

Q.16 Shreya is the sister of Atishay. Atishay is the brother of Harsh. Harsh is the father of Mamta. Mamta is the wife of Girish. How is Shreya related to Girish?

- Ans**
- ☐ 1. Wife's father's brother
 - ☒ 2. Wife's father's sister
 - ☐ 3. Wife's mother's mother
 - ☐ 4. Wife's father's mother

Q.17 In a certain code language, 'DUET' is coded as '7523' and 'UGLY' is coded as '4136'. What is the code for 'U' in the given code language?

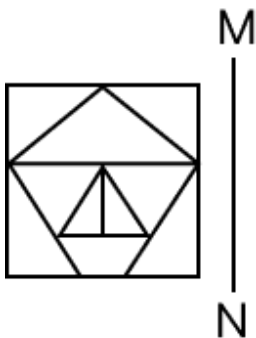
- Ans
- ☐ 1. 7
 - ☐ 2. 5
 - ☐ 3. 1
 - ☒ 4. 3

Q.18 If 'E' stands for '+', 'F' stands for '-', 'G' stands for '×' and 'H' stands for '÷', then what will come in place of the question mark '?' in the following equation?

$$88 \text{ H } 11 \text{ G } 2 \text{ E } 9 \text{ F } 6 = ?$$

- Ans
- ☐ 1. 21
 - ☐ 2. 17
 - ☒ 3. 19
 - ☐ 4. 15

Q.19 Select the correct mirror image of the given figure when the mirror is placed at MN as shown below.



Ans

- ☐ 1.
- ☒ 2.
- ☐ 3.
- ☐ 4.

Q.20 What should come in place of '?' in the given series?
75, 84, 102, 129, 165, ?

- Ans
- ☐ 1. 214
 - ☐ 2. 212
 - ☒ 3. 210
 - ☐ 4. 208

Q.1 Ishan has ₹1302 with him. He divided it amongst his sons Krish and Veer and asked them to invest it at 10% rate of interest, compounded annually. It was seen that Krish and Veer got the same amount after 19 and 20 years respectively. How much (in ₹) did Ishan give to Veer?

- Ans**
- ☒ 1. 620
 - ☐ 2. 622
 - ☐ 3. 642
 - ☐ 4. 630

Q.2 Karan and Arjun started a startup by investing ₹5,30,000 and ₹6,50,000, respectively. After six months, Arjun withdrew ₹50,000. They continued for another six months. Find the ratio of their profits after one year.

- Ans**
- ☐ 1. 53:65
 - ☐ 2. 53:60
 - ☒ 3. 106:125
 - ☐ 4. 104:135

Q.3 What sum of money (in ₹) will yield ₹660 as simple interest in 2 years at 5% per annum?

- Ans**
- ☒ 1. 6600
 - ☐ 2. 6800
 - ☐ 3. 6100
 - ☐ 4. 7000

Q.4 The parallel sides of a trapezium are in the ratio of 4:7. The area and height of the trapezium are 935 cm² and 10 cm, respectively. Its non-parallel sides are equal, and each of it is equal to 27.39 cm. Find its perimeter.

- Ans**
- ☐ 1. 303.58 cm
 - ☐ 2. 314.05 cm
 - ☐ 3. 259.62 cm
 - ☒ 4. 241.78 cm

Q.5 A number when increased by 130%, gives 3220. The number is:

- Ans**
- ☐ 1. 2800
 - ☐ 2. 4200
 - ☐ 3. 700
 - ☒ 4. 1400

Q.6 A sofa set, when sold for ₹90,000, results in a 10% loss to the shopkeeper. What would be his profit or loss percentage if it were sold for ₹1,10,000?

- Ans**
- ☐ 1. Loss of 10%
 - ☒ 2. Profit of 10%
 - ☐ 3. Profit of 5%
 - ☐ 4. Loss of 5%

Q.7 Sharat, Rajat, Samrat, and Bharat go on a trip together by car. Sharat drives for the first 2 hours at an average speed of 55 km/h. Samrat drives for the next 1 hour at 46 km/h. Bharat drives for the next 2.5 hours at 80 km/h. Rajat drives for the next half hour at 60 km/h. Find the average speed for the whole journey. (Round off your answer to two decimal places.)

- Ans**
- ☐ 1. 58.74 km/hr
 - ☒ 2. 64.33 km/hr
 - ☐ 3. 75.55 km/hr
 - ☐ 4. 69.53 km/hr

Q.8 A train 100 m long is travelling at a speed of 160 km/h and passes another train whose speed is half that of the first train. They travel in opposite directions and cross each other in 20 seconds. Find the length of the second train.

- Ans**
- ☒ 1. $\frac{3700}{3}$ m
 - ☐ 2. $\frac{2445}{3}$ m
 - ☐ 3. $\frac{3550}{3}$ m
 - ☐ 4. $\frac{1550}{3}$ m

Q.9 A shopkeeper bought six identical mobile phones for ₹45,000 and sold two of them for ₹18,000. Find the gain percentage.

- Ans**
- ☐ 1. 30%
 - ☐ 2. 25%
 - ☒ 3. 20%
 - ☐ 4. 15%

Q.10 If $45p + 45q = 127.35$, then find the average of p and q.

- Ans**
- ☐ 1. 2.83
 - ☐ 2. 5.66
 - ☒ 3. 1.415
 - ☐ 4. 11.32

Q.11 A student's marks were incorrectly entered as 65 instead of 83. Due to this, the average marks of the class got decreased by $\frac{9}{8}$. What is the number of students in the class?

- Ans**
- ☐ 1. 6
 - ☐ 2. 14
 - ☐ 3. 25
 - ☒ 4. 16

Q.12 The value of $\sqrt{324} + \sqrt{0.0169} - \sqrt{6.76} =$

- Ans**
- ☐ 1. 16.2
 - ☐ 2. 10.87
 - ☐ 3. 4.51
 - ☒ 4. 15.53

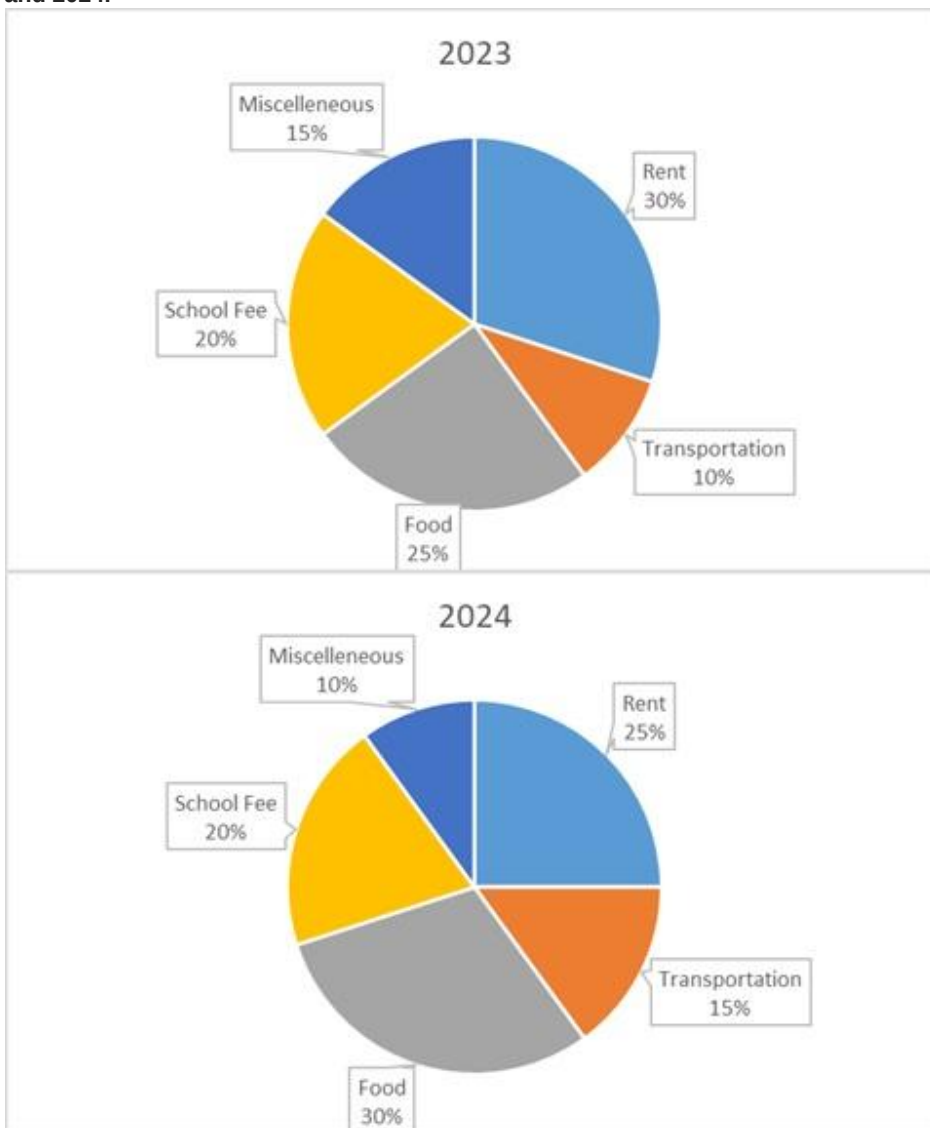
Q.13 Divide ₹4809 into three parts in such a way that half of the first part, one-fourth of the second part and one-eighth of the third part are equal. What is the value of the third part (in ₹)?

- Ans**
- ☐ 1. 3048
 - ☐ 2. 2948
 - ☒ 3. 2748
 - ☐ 4. 2448

Q.14 A tap fills a cistern in 14 hours. Another tap empties the full tank in 28 hours. How long (in hours) will it take to fill one-fourth of the tank, if the tank is empty initially and both the taps are open together?

- Ans**
- ☐ 1. 14
 - ☐ 2. 28
 - ☐ 3. 21
 - ☒ 4. 7

Q.15 Two pie charts show the expenditure breakup (in per cent) of a family in the years 2023 and 2024.



The total expenditures during the years 2023 and 2024 are ₹80,000 and ₹1,10,000, respectively. Find the total amount spent on transportation during these two years.

- Ans
- ☒ 1. ₹27,500
 - ☒ 2. ₹23,250
 - ☒ 3. ₹20,000
 - ☒ 4. ₹24,500

Q.16 A shopkeeper offers the following schemes on toys, all having the same marked price.
(A) Successive discounts of 37% and 12% on any number of toys bought.
(B) Successive discounts of 3%, 34%, and 38% on any number of toys bought.
(C) A discount of 50% on the first 7 toys and a discount of 22% on each toy thereafter.
(D) Ten toys free of cost on buying ten toys.
A customer wants to buy 10 toys. Which of the above schemes is the least beneficial to her?

- Ans
- ☒ 1. A
 - ☒ 2. B
 - ☒ 3. D
 - ☒ 4. C

Q.17 The three vertices of a parallelogram PQRS are P(4,6), Q(1,2) and R(4,2). Find the coordinates of the fourth vertex S and also find the area of the parallelogram.

- Ans
- ☒ 1. (15,14); 16 sq.units
 - ☒ 2. (4,4); 22 sq.units
 - ☒ 3. (7,6); 12 sq.units
 - ☒ 4. (8,8); 10 sq.units

Q.18 Simplify the following expression.

$$\sqrt{169} - 5^2 + (8^2 \div 4) \times \sqrt{25}$$

- Ans
- ☒ 1. 68
 - ☐ 2. 50
 - ☐ 3. 0
 - ☐ 4. 10

Q.19 Simplify: $\frac{4^4 \times 4^5 \times 5^5}{4^1 \times 4^1 \times 5^3}$

- Ans
- ☒ 1. 409600
 - ☐ 2. 102400
 - ☐ 3. 819100
 - ☐ 4. 204800

Q.20 The marked price of an article is ₹900. It is sold at successive discounts of 10% and 5%.
The selling price of the article is:

- Ans
- ☐ 1. ₹770.25
 - ☐ 2. ₹750
 - ☐ 3. ₹780
 - ☒ 4. ₹769.50

Section : Hindi Language and Comprehension

Q.1 दिए गए प्रश्न में, विभिन्न खंडों में विभाजित एक कथन दिया गया है। एक सुसंगत कथन बनाने के लिए सभी खंडों को पुनर्व्यवस्थित करें।
रमेश की (क)/ और उसे कई चोटें आईं (ख)/ बहन शीला (ग)/ तेजी से चलती (घ)/ बस से गिर पड़ी (ङ)।

- Ans
- ☐ 1. क ङ घ ग ख
 - ☐ 2. क ख ग घ ङ
 - ☐ 3. क ख ग ङ घ
 - ☒ 4. क ग घ ङ ख

Q.2 'जिसकी इच्छा की जाए' वाक्यांश के लिए सार्थक शब्द होगा -

- Ans
- ☒ 1. इच्छित
 - ☐ 2. इच्छना
 - ☐ 3. इच्छापत्र
 - ☐ 4. इच्छुक

Q.3 दिए गए वाक्य में उचित कारक का प्रयोग करके वाक्य पूर्ण करें-
राम, सीता _____ सौन्दर्य देखते ही रह गये।

- Ans
- ☐ 1. ने
 - ☐ 2. से
 - ☒ 3. का
 - ☐ 4. को

Q.4 उपयुक्त विशेषण शब्द चुनकर वाक्य पूर्ण करें :-
वह लड़का बहुत है

- Ans
- ☐ 1. काना
 - ☐ 2. अँधा
 - ☒ 3. ओजस्वी
 - ☐ 4. विरोधी

Q.5	दिए गए वाक्य में रिक्त स्थान के लिए उपयुक्त विशेषण चुनें । एक कपड़े से काम चल जाएगा ।
Ans	✗ 1. सीटर ✗ 2. लीटर ✓ 3. मीटर ✗ 4. मटर
Q.6	'वह जो उपन्यास लिखता हो' वाक्यांश के लिए सार्थक शब्द होगा -
Ans	✗ 1. उपन्यास ✗ 2. उपन्यासालोचन ✓ 3. उपन्यासकार ✗ 4. उपन्यासीकरण
Q.7	निम्नलिखित लोकोक्ति का दिए गए विकल्पों में से सटीक अर्थ चुनिए – अंधा बगुला की चड़ खाए
Ans	✓ 1. अभागा सुख से वंचित रह जाता है ✗ 2. परिश्रम किसी का ,लाभ किसी को ✗ 3. शर्म के मारे क्रोध करना ✗ 4. छोटा बड़े को उपदेश देता है
Q.8	वाक्य में रेखांकित शब्द का पर्यायवाची पहचानें- 'सूपर्णखा रावण की <u>बहनु</u> थी ।'
Ans	✗ 1. भीति ✗ 2. भद्रा ✗ 3. भाभी ✓ 4. भगिनी
Q.9	उपयुक्त क्रिया का चयन करके वाक्य पूर्ण करें- घोड़ा घास है ।
Ans	✓ 1. खाता ✗ 2. निगलता ✗ 3. चबाता ✗ 4. भागता
Q.10	निम्नलिखित विकल्पों में से वाक्य को उचित क्रम में लिखें- 1- शैली में लिखा गया 2- 'शेखर- एक जीवनी' 3- उपन्यास है 4- वस्तुतः आत्मकथात्मक
Ans	✓ 1. 2, 4, 1, 3 ✗ 2. 1, 3, 4, 2 ✗ 3. 4, 2, 3, 1 ✗ 4. 3, 4, 2, 1
Q.11	शुद्ध वर्तनी वाला वाक्य चुनिए —
Ans	✓ 1. बच्चे खेलते हुए पार्क में जा रहे हैं । ✗ 2. वह विद्यालय नहीं गये । ✗ 3. मुझे आपकी बातों पर विश्वास हैं । ✗ 4. वे जल्दी खाना खाई ।
Q.12	दिए गए वाक्यों में से वर्तनी की दृष्टि से शुद्ध वाक्य का चयन कीजिए ।
Ans	✗ 1. मैं वीणा बजाना नहीं जानता हू । ✓ 2. मैं वीणा बजाना नहीं जानता हूँ । ✗ 3. मैं वीना बजाना नहीं जानता हूँ । ✗ 4. मैं वीणा बजना नहीं जानता हूँ ।

Q.13 निम्न में से कौन सा शब्द दिए गए वाक्य में रेखांकित शब्द का पर्यायवाची है?
' राजा अपनी प्रजा से कर वसूलता है । '

- Ans
- ☒ 1. महसूल
 - ☒ 2. महेश्वर
 - ☒ 3. अलंकृत
 - ☒ 4. महिषी

Q.14 दिये गये वाक्य को पूर्ण करने के लिए सबसे उपयुक्त क्रिया-विशेषण का चयन करें-

मच्छरों से होने वाली बीमारियों के प्रति _____ जागरूकता फैलाना आवश्यक है ।

- Ans
- ☒ 1. कभी-कभी
 - ☒ 2. नियामक
 - ☒ 3. सावधानीपूर्वक
 - ☒ 4. अचानक

Q.15 'सब्ज बाग दिखाना' मुहावरे का सही अर्थ है –

- Ans
- ☒ 1. दुर्गत करना
 - ☒ 2. बेईमानी से लेना
 - ☒ 3. अच्छी बातें कहकर बहकाना
 - ☒ 4. सयाना होना

Comprehension:

निम्नलिखित गद्यांश को पढ़कर सही विकल्प का चयन करें -

धर्म एक व्यक्तिगत वस्तु है , वह राष्ट्र के कार्य में बाधक क्यों हो ? वह धर्म, धर्म ही नहीं, जो दया और न्याय पर आश्रित न हो , पर वास्तविकता यह है कि धर्म के नाम का राजनीति के लिए उपयोग किया जाता है । धर्म के नाम पर उसका उपयोग राजनीति तथा जनता की सांप्रदायिक बुद्धि होने के कारण वह राजनीतिज्ञों के हाथों में खेलती है । राज्य को किसी धर्म में हस्तक्षेप नहीं करना चाहिए , किन्तु ऐसे उपाय अवश्य सोचने चाहिए जो इस सांप्रदायिक बुद्धि को विनष्ट करने में सहायक हो । केवल उपदेश देना कि हिन्दू-मुसलमान-सिख आदि को परस्पर प्रेम से रहना चाहिए , आज पर्याप्त नहीं है । हमें अपनी दुर्बलता के कारण ढूँढने चाहिए तथा उन्हें दूर करने का प्रयत्न भी करना चाहिए । इस समय एक ऐसे उदार सांस्कृतिक आंदोलन की आवश्यकता है , जो हमारे दूषित मन को विशुद्ध करे और युग के अनुकूल हममें नए संस्कार उत्पन्न करके हमें उदार बुद्धि प्रदान करे । सांप्रदायिक बुद्धि को विनष्ट करने के लिए यह परमावश्यक है कि ये बातें , जिनका धर्म से सम्बन्ध नहीं होना चाहिए , कानून से निश्चित हों ।

SubQuestion No : 16

Q.16 निम्नलिखित में से कौन-सा शीर्षक इस गद्यांश के लिए सबसे उपयुक्त है?

- Ans
- ☒ 1. धर्म और राजनीति
 - ☒ 2. धर्म का व्यक्तिगत महत्व
 - ☒ 3. सांस्कृतिक आंदोलन और प्रेम
 - ☒ 4. सांप्रदायिकता और कानून

Comprehension:

निम्नलिखित गद्यांश को पढ़कर सही विकल्प का चयन करें -

धर्म एक व्यक्तिगत वस्तु है , वह राष्ट्र के कार्य में बाधक क्यों हो ? वह धर्म, धर्म ही नहीं, जो दया और न्याय पर आश्रित न हो , पर वास्तविकता यह है कि धर्म के नाम का राजनीति के लिए उपयोग किया जाता है । धर्म के नाम पर उसका उपयोग राजनीति तथा जनता की सांप्रदायिक बुद्धि होने के कारण वह राजनीतिज्ञों के हाथों में खेलती है । राज्य को किसी धर्म में हस्तक्षेप नहीं करना चाहिए , किन्तु ऐसे उपाय अवश्य सोचने चाहिए जो इस सांप्रदायिक बुद्धि को विनष्ट करने में सहायक हो । केवल उपदेश देना कि हिन्दू-मुसलमान-सिख आदि को परस्पर प्रेम से रहना चाहिए , आज पर्याप्त नहीं है । हमें अपनी दुर्बलता के कारण ढूँढने चाहिए तथा उन्हें दूर करने का प्रयत्न भी करना चाहिए । इस समय एक ऐसे उदार सांस्कृतिक आंदोलन की आवश्यकता है , जो हमारे दूषित मन को विशुद्ध करे और युग के अनुकूल हममें नए संस्कार उत्पन्न करके हमें उदार बुद्धि प्रदान करे । सांप्रदायिक बुद्धि को विनष्ट करने के लिए यह परमावश्यक है कि ये बातें , जिनका धर्म से सम्बन्ध नहीं होना चाहिए , कानून से निश्चित हों ।

SubQuestion No : 17

Q.17 उपर्युक्त गद्यांश में प्रयुक्त 'समय' शब्द के लिए उपयुक्त पर्यायवाची चुनें -

- Ans
- ☒ 1. आकाशगंगा
 - ☒ 2. अवधि
 - ☒ 3. अवध
 - ☒ 4. निर्दिष्ट

Comprehension:

निम्नलिखित गद्यांश को पढ़कर सही विकल्प का चयन करें -

धर्म एक व्यक्तिगत वस्तु है, वह राष्ट्र के कार्य में बाधक क्यों हो ? वह धर्म, धर्म ही नहीं, जो दया और न्याय पर आश्रित न हो, पर वास्तविकता यह है कि धर्म के नाम का राजनीति के लिए उपयोग किया जाता है। धर्म के नाम पर उसका उपयोग राजनीति तथा जनता की सांप्रदायिक बुद्धि होने के कारण वह राजनीतिज्ञों के हाथों में खेलती है। राज्य को किसी धर्म में हस्तक्षेप नहीं करना चाहिए, किन्तु ऐसे उपाय अवश्य सोचने चाहिए जो इस सांप्रदायिक बुद्धि को विनष्ट करने में सहायक हो। केवल उपदेश देना कि हिन्दू-मुसलमान-सिख आदि को परस्पर प्रेम से रहना चाहिए, आज पर्याप्त नहीं है। हमें अपनी दुर्बलता के कारण ढूँढ़ने चाहिए तथा उन्हें दूर करने का प्रयत्न भी करना चाहिए। इस समय एक ऐसे उदार सांस्कृतिक आंदोलन की आवश्यकता है, जो हमारे दूषित मन को विशुद्ध करे और युग के अनुकूल हममें नए संस्कार उत्पन्न करके हमें उदार बुद्धि प्रदान करे। सांप्रदायिक बुद्धि को विनष्ट करने के लिए यह परमावश्यक है कि ये बातें, जिनका धर्म से सम्बन्ध नहीं होना चाहिए, कानून से निश्चित हों।

SubQuestion No : 18

Q.18 गद्यांश के अनुसार, धर्म और राजनीति के इस मिश्रण का वास्तविक जीवन में क्या परिणाम होता है?

- Ans
- ☒ 1. धर्म और राजनीति का कोई संबंध नहीं होता।
 - ☒ 2. धर्म का उद्देश्य केवल कानून बनाना है।
 - ☒ 3. धर्म केवल व्यक्तिगत वस्तु रहता है।
 - ☒ 4. धर्म का नाम लेकर राजनीति में जनता की सांप्रदायिक बुद्धि का शोषण होता है।

Comprehension:

निम्नलिखित गद्यांश को पढ़कर सही विकल्प का चयन करें -

धर्म एक व्यक्तिगत वस्तु है, वह राष्ट्र के कार्य में बाधक क्यों हो ? वह धर्म, धर्म ही नहीं, जो दया और न्याय पर आश्रित न हो, पर वास्तविकता यह है कि धर्म के नाम का राजनीति के लिए उपयोग किया जाता है। धर्म के नाम पर उसका उपयोग राजनीति तथा जनता की सांप्रदायिक बुद्धि होने के कारण वह राजनीतिज्ञों के हाथों में खेलती है। राज्य को किसी धर्म में हस्तक्षेप नहीं करना चाहिए, किन्तु ऐसे उपाय अवश्य सोचने चाहिए जो इस सांप्रदायिक बुद्धि को विनष्ट करने में सहायक हो। केवल उपदेश देना कि हिन्दू-मुसलमान-सिख आदि को परस्पर प्रेम से रहना चाहिए, आज पर्याप्त नहीं है। हमें अपनी दुर्बलता के कारण ढूँढ़ने चाहिए तथा उन्हें दूर करने का प्रयत्न भी करना चाहिए। इस समय एक ऐसे उदार सांस्कृतिक आंदोलन की आवश्यकता है, जो हमारे दूषित मन को विशुद्ध करे और युग के अनुकूल हममें नए संस्कार उत्पन्न करके हमें उदार बुद्धि प्रदान करे। सांप्रदायिक बुद्धि को विनष्ट करने के लिए यह परमावश्यक है कि ये बातें, जिनका धर्म से सम्बन्ध नहीं होना चाहिए, कानून से निश्चित हों।

SubQuestion No : 19

Q.19 गद्यांश के उपयुक्त सारांश का चयन करें-

- Ans
- ☒ 1. सांप्रदायिक बुद्धि का ज्ञान होना चाहिए।
 - ☒ 2. हमें धर्म तथा राजनीति का सम्बन्ध समझना चाहिए।
 - ☒ 3. हिन्दू - मुस्लिम में परस्पर प्रेम की भावना रखनी चाहिए।
 - ☒ 4. हमें निःस्वार्थ भाव से राष्ट्र हित की दृष्टि से विचार करना चाहिए।

Comprehension:

निम्नलिखित गद्यांश को पढ़कर सही विकल्प का चयन करें -

धर्म एक व्यक्तिगत वस्तु है, वह राष्ट्र के कार्य में बाधक क्यों हो ? वह धर्म, धर्म ही नहीं, जो दया और न्याय पर आश्रित न हो, पर वास्तविकता यह है कि धर्म के नाम का राजनीति के लिए उपयोग किया जाता है। धर्म के नाम पर उसका उपयोग राजनीति तथा जनता की सांप्रदायिक बुद्धि होने के कारण वह राजनीतिज्ञों के हाथों में खेलती है। राज्य को किसी धर्म में हस्तक्षेप नहीं करना चाहिए, किन्तु ऐसे उपाय अवश्य सोचने चाहिए जो इस सांप्रदायिक बुद्धि को विनष्ट करने में सहायक हो। केवल उपदेश देना कि हिन्दू-मुसलमान-सिख आदि को परस्पर प्रेम से रहना चाहिए, आज पर्याप्त नहीं है। हमें अपनी दुर्बलता के कारण ढूँढ़ने चाहिए तथा उन्हें दूर करने का प्रयत्न भी करना चाहिए। इस समय एक ऐसे उदार सांस्कृतिक आंदोलन की आवश्यकता है, जो हमारे दूषित मन को विशुद्ध करे और युग के अनुकूल हममें नए संस्कार उत्पन्न करके हमें उदार बुद्धि प्रदान करे। सांप्रदायिक बुद्धि को विनष्ट करने के लिए यह परमावश्यक है कि ये बातें, जिनका धर्म से सम्बन्ध नहीं होना चाहिए, कानून से निश्चित हों।

SubQuestion No : 20

Q.20 इस गद्यांश का मुख्य या केंद्रीय भाव क्या है?

- Ans
- ☒ 1. सभी धर्मों को एक साथ मिलाना चाहिए।
 - ☒ 2. धर्म और कानून का कोई संबंध नहीं है।
 - ☒ 3. धर्म का केवल व्यक्तिगत महत्व है।
 - ☒ 4. धर्म और राजनीति को अलग करना आवश्यक है और सांप्रदायिकता के नाश हेतु कानून और उदार सांस्कृतिक आंदोलन की आवश्यकता है।

Section : English Language and Comprehension

Q.1 Select the correct option to complete the given sentence.
The hikers paused to rest _____ a cluster of dense, shady trees.

- Ans
- ☒ 1. through
 - ☒ 2. beneath
 - ☒ 3. over
 - ☒ 4. towards

Q.2 Choose the correct option to complete the sentence.

The committee finally arrived _____ a unanimous decision after several hours of debate.

- Ans**
- ☒ 1. at
 - ☐ 2. on
 - ☐ 3. to
 - ☐ 4. for

Q.3 Identify the antonym of the underlined word used in the sentence.

The teacher found the student's answer relevant to the topic.

- Ans**
- ☐ 1. significant
 - ☒ 2. inappropriate
 - ☐ 3. similar
 - ☐ 4. connected

Q.4 There are four parts of the sentence (labelled P, Q, R and S) given below. Select the correct option to arrange the four parts to make a coherent sentence.

in space and collect valuable data for future missions to the moon and Mars (P) / but also for its scientific goals and the risks involved (Q) / the Polaris Dawn mission is unique not just for its duration (R) / as the crew will conduct research on radiation exposure (S)

- Ans**
- ☐ 1. RSQP
 - ☐ 2. QRPS
 - ☐ 3. PQRS
 - ☒ 4. RQSP

Q.5 Choose the most appropriate one-word substitution for the highlighted phrase given in the sentence.

The art collector decided to give up or surrender a possession, right, his claim to the museum.

- Ans**
- ☐ 1. Seize
 - ☒ 2. Relinquish
 - ☐ 3. Retain
 - ☐ 4. Acquire

Q.6 Identify the antonym of the underlined word used in the sentence.

Despite facing several setbacks, the team remained optimistic about the project's outcome.

- Ans**
- ☐ 1. barriers
 - ☒ 2. opportunities
 - ☐ 3. difficulties
 - ☐ 4. challenges

Q.7 Choose the sentence correctly written in Active Voice.

- Ans**
- ☐ 1. The report is being prepared by the manager.
 - ☒ 2. The manager was preparing the report.
 - ☐ 3. The report was prepared by the manager.
 - ☐ 4. The report had been prepared by the manager.

Q.8 Identify the incorrectly spelt word from the following sentence.

Our schedule requires a thorough rehearsal to guarantee the necessary preparations are complete.

- Ans**
- ☒ 1. guarantee
 - ☐ 2. rehearsal
 - ☐ 3. schedule
 - ☐ 4. thorough

Q.9 Parts of a sentence are given below in jumbled order. Rearrange all the parts to form a coherent sentence.

- (A) despite intense debate during the symposium,
(B) participants agreed on the need for clearer interdisciplinary terminology,
(C) which would facilitate collaboration in emerging research areas,
(D) and streamline the publication process across journals.

- Ans**
- ☒ 1. BCAD
 - ☒ 2. ACBD
 - ☒ 3. ADBC
 - ☒ 4. ABCD

Q.10 Select the correct option to complete the given sentence.
..... prime determinant of their success was the meticulous planning and execution of innovative marketing strategy.

- Ans**
- ☒ 1. A, an
 - ☒ 2. The, an
 - ☒ 3. A, the
 - ☒ 4. The, the

Q.11 Choose the correct idiom that can replace the underlined segment without changing the meaning of the sentence.

After months of unemployment, Ravi finally recovered from his financial troubles.

- Ans**
- ☒ 1. got back on his feet
 - ☒ 2. came back to life
 - ☒ 3. drew the line
 - ☒ 4. hit the nail on the head

Q.12 Choose the sentence correctly written in Direct Speech.

- Ans**
- ☒ 1. Riya said, "I am feeling tired."
 - ☒ 2. Riya said she was feeling tired.
 - ☒ 3. Riya said that she was feeling tired.
 - ☒ 4. Riya said that "I am feeling tired."

Q.13 Choose the correct idiom that can replace the underlined segment without changing the meaning of the sentence.

When the plan failed, the team members had to accept the consequences of their decision.

- Ans**
- ☒ 1. faced the music
 - ☒ 2. hit the books
 - ☒ 3. made up their minds
 - ☒ 4. turned over a new leaf

Q.14 Select the word which means the same as the underlined group of words.
The detective was known for his skill in interpreting signs and hidden meanings.

- Ans**
- ☒ 1. Etymology
 - ☒ 2. Semiotics
 - ☒ 3. Hermeneutics
 - ☒ 4. Anthropology

Q.15 Choose the sentence that is correctly written in the Past Perfect Tense.

- Ans**
- ☒ 1. The guests had arrived before the rain started.
 - ☒ 2. The guests have arrived before the rain started.
 - ☒ 3. The guests arrived before the rain started.
 - ☒ 4. The guests were arriving before the rain started.

Comprehension:

Read the passage carefully and answer the questions that follow:

The Non-Cooperation Movement, launched by Mahatma Gandhi in 1920, marked a turning point in India's struggle for independence. It was India's first large-scale attempt to resist British rule through nonviolent means. Gandhi urged people to withdraw from government institutions, boycott British goods, and promote swadeshi or self-reliance. The movement spread rapidly across towns and villages, uniting people from diverse regions, religions, and classes under a common cause. For the first time, ordinary citizens—farmers, students, and workers—became active participants in the freedom struggle. However, when violence broke out at Chauri Chaura in 1922, resulting in the death of policemen, Gandhi called off the movement immediately, emphasizing that freedom could not be achieved through bloodshed. Although the movement did not attain its immediate political goals, it awakened the masses to the power of collective action and moral resistance. It demonstrated that independence was not only a political objective but also a moral and social transformation based on truth, nonviolence, and self-discipline. The Non-Cooperation Movement thus became a moral foundation upon which India's later struggles for freedom were built.

SubQuestion No : 16

Q.16 What was the primary method of resistance promoted by Gandhi in the Non-Cooperation Movement?

- Ans**
- ☒ 1. Armed rebellion
 - ☒ 2. Nonviolent protest
 - ☒ 3. Economic sanctions
 - ☒ 4. Foreign alliances

Comprehension:

Read the passage carefully and answer the questions that follow:

The Non-Cooperation Movement, launched by Mahatma Gandhi in 1920, marked a turning point in India's struggle for independence. It was India's first large-scale attempt to resist British rule through nonviolent means. Gandhi urged people to withdraw from government institutions, boycott British goods, and promote swadeshi or self-reliance. The movement spread rapidly across towns and villages, uniting people from diverse regions, religions, and classes under a common cause. For the first time, ordinary citizens—farmers, students, and workers—became active participants in the freedom struggle. However, when violence broke out at Chauri Chaura in 1922, resulting in the death of policemen, Gandhi called off the movement immediately, emphasizing that freedom could not be achieved through bloodshed. Although the movement did not attain its immediate political goals, it awakened the masses to the power of collective action and moral resistance. It demonstrated that independence was not only a political objective but also a moral and social transformation based on truth, nonviolence, and self-discipline. The Non-Cooperation Movement thus became a moral foundation upon which India's later struggles for freedom were built.

SubQuestion No : 17

Q.17 What can be inferred about Gandhi's leadership from the Chauri Chaura incident?

- Ans**
- ☒ 1. He encouraged violence against colonial rule.
 - ☒ 2. He valued discipline and moral conduct over victory.
 - ☒ 3. He feared the British government's reaction.
 - ☒ 4. He lost faith in his followers.

Comprehension:

Read the passage carefully and answer the questions that follow:

The Non-Cooperation Movement, launched by Mahatma Gandhi in 1920, marked a turning point in India's struggle for independence. It was India's first large-scale attempt to resist British rule through nonviolent means. Gandhi urged people to withdraw from government institutions, boycott British goods, and promote swadeshi or self-reliance. The movement spread rapidly across towns and villages, uniting people from diverse regions, religions, and classes under a common cause. For the first time, ordinary citizens—farmers, students, and workers—became active participants in the freedom struggle. However, when violence broke out at Chauri Chaura in 1922, resulting in the death of policemen, Gandhi called off the movement immediately, emphasizing that freedom could not be achieved through bloodshed. Although the movement did not attain its immediate political goals, it awakened the masses to the power of collective action and moral resistance. It demonstrated that independence was not only a political objective but also a moral and social transformation based on truth, nonviolence, and self-discipline. The Non-Cooperation Movement thus became a moral foundation upon which India's later struggles for freedom were built.

SubQuestion No : 18

Q.18 What is the central theme of the passage?

- Ans**
- ☒ 1. The moral and social power of nonviolent resistance
 - ☒ 2. The importance of foreign support in freedom struggles
 - ☒ 3. The dangers of political unrest in India
 - ☒ 4. The failure of early independence movements

Comprehension:

Read the passage carefully and answer the questions that follow:

The Non-Cooperation Movement, launched by Mahatma Gandhi in 1920, marked a turning point in India's struggle for independence. It was India's first large-scale attempt to resist British rule through nonviolent means. Gandhi urged people to withdraw from government institutions, boycott British goods, and promote swadeshi or self-reliance. The movement spread rapidly across towns and villages, uniting people from diverse regions, religions, and classes under a common cause. For the first time, ordinary citizens—farmers, students, and workers—became active participants in the freedom struggle. However, when violence broke out at Chauri Chaura in 1922, resulting in the death of policemen, Gandhi called off the movement immediately, emphasizing that freedom could not be achieved through bloodshed. Although the movement did not attain its immediate political goals, it awakened the masses to the power of collective action and moral resistance. It demonstrated that independence was not only a political objective but also a moral and social transformation based on truth, nonviolence, and self-discipline. The Non-Cooperation Movement thus became a moral foundation upon which India's later struggles for freedom were built.

SubQuestion No : 19

Q.19 Which tone best describes the author's approach?

- Ans**
- ☒ 1. Reverent and reflective
 - ☐ 2. Critical and Cynical
 - ☐ 3. Jovial and Jocular/Humorous
 - ☐ 4. Indifferent and indignant

Comprehension:

Read the passage carefully and answer the questions that follow:

The Non-Cooperation Movement, launched by Mahatma Gandhi in 1920, marked a turning point in India's struggle for independence. It was India's first large-scale attempt to resist British rule through nonviolent means. Gandhi urged people to withdraw from government institutions, boycott British goods, and promote swadeshi or self-reliance. The movement spread rapidly across towns and villages, uniting people from diverse regions, religions, and classes under a common cause. For the first time, ordinary citizens—farmers, students, and workers—became active participants in the freedom struggle. However, when violence broke out at Chauri Chaura in 1922, resulting in the death of policemen, Gandhi called off the movement immediately, emphasizing that freedom could not be achieved through bloodshed. Although the movement did not attain its immediate political goals, it awakened the masses to the power of collective action and moral resistance. It demonstrated that independence was not only a political objective but also a moral and social transformation based on truth, nonviolence, and self-discipline. The Non-Cooperation Movement thus became a moral foundation upon which India's later struggles for freedom were built.

SubQuestion No : 20

Q.20 Which is the most appropriate title for the passage?

- Ans**
- ☐ 1. The Birth of Indian Nationalism: Awakening a Nation
 - ☐ 2. The Tragedy of Chauri Chaura: The Impact
 - ☐ 3. India's First Political Uprising: The Power of Action
 - ☒ 4. Gandhi's Moral Revolution: The Non-Cooperation Movement

Section : Discipline1

Q.1 If a certain iron-cobalt alloy has a higher Curie Temperature than pure iron, this indicates that the alloy:

- Ans**
- ☐ 1. is always a stronger magnet at room temperature
 - ☐ 2. is more easily magnetized
 - ☐ 3. has lower hysteresis losses
 - ☒ 4. will maintain its ferromagnetic properties to a higher temperature

Q.2 A resistor is often connected in series with an LED (Light Emitting Diode). The primary purpose of this resistor is to:

- Ans**
- ☐ 1. increase the light output of the LED
 - ☐ 2. decrease the voltage drop across the LED
 - ☐ 3. store charge for the LED
 - ☒ 4. protect the LED by limiting the current flowing through it

Q.3 How many input bits does a Half Adder circuit have?

- Ans**
- ☒ 1. 2 bits
 - ☐ 2. 1/2 bit
 - ☐ 3. 3/2 bits
 - ☐ 4. 4 bits

Q.4 The primary characteristic of a thermoplastic resin that distinguishes it from a thermoset is its ability to:

- Ans**
- ☒ 1. Soften when heated and harden when cooled, repeatedly
 - ☐ 2. Cure irreversibly into an infusible solid
 - ☐ 3. Withstand very high temperatures without deforming
 - ☐ 4. Form cross-linked bonds when heated

Q.5 The Schering Bridge is particularly suited for the measurement of:

- Ans**
- ☐ 1. Semiconductor junction properties.
 - ☐ 2. Very low resistances and inductances.
 - ☒ 3. Capacitance, particularly for insulating materials, and loss angles.
 - ☐ 4. High-Q inductors and mutual inductance.

Q.6 In computer programming, what does the "name" of a variable (like score or count) primarily represent?

- Ans**
- ☐ 1. The actual data value stored in the variable
 - ☐ 2. The memory address where the variable's value is stored.
 - ☐ 3. The data type of the value, such as integer or character.
 - ☒ 4. A programmer-friendly identifier to refer to a memory location holding a value.

Q.7 What is the 2's complement of the binary number 11011001?

- Ans**
- ☐ 1. 00100011
 - ☒ 2. 00100111
 - ☐ 3. 00101111
 - ☐ 4. 00100110

Q.8 Compared to AAAC (All-Aluminium Alloy Conductor), ACSR (Aluminium Conductor Steel Reinforced) has:

- Ans**
- ☐ 1. Higher hysteresis losses
 - ☐ 2. Higher skin effect
 - ☐ 3. No magnetic hysteresis losses
 - ☒ 4. Higher tensile strength

Q.9 In the C programming language, consider the following statements about different function types and storage classes.
(I) A function declared with the `static` keyword has internal linkage and cannot be accessed from other source files.
(II) An `inline` function suggestion to the compiler replaces the function call with the actual function code at compile-time to reduce overhead.
(III) A variable declared with the `auto` storage class retains its value between multiple function calls.
(IV) A register variable is guaranteed to be stored in a CPU register for faster access.
Which of the above statements are correct?

- Ans**
- ☐ 1. Only III and IV
 - ☒ 2. Only I and II
 - ☐ 3. Only I, II, and III
 - ☐ 4. Only II and IV

Q.10 In programming, what is the result of the expression $17 \% 5$?

- Ans**
- ☐ 1. 3.4
 - ☐ 2. 3
 - ☐ 3. 85
 - ☒ 4. 2

Q.11 Among the following, which material has the lowest electrical resistivity at room temperature?

- Ans**
- ☐ 1. Gold
 - ☒ 2. Silver
 - ☐ 3. Diamond
 - ☐ 4. Aluminium

Q.12 What will be the output of the following C code?

```
c
#include <stdio.h>int main() {    int count = 5;        while(count > 0) {        pr
```

- Ans**
- ☐ 1. 4 3 2 1 0
 - ☐ 2. 5 4 3 2 1 0
 - ☒ 3. 5 4 3 2 1
 - ☐ 4. Infinite loop

Q.13 When using a Megger to test a live electrical panel, the correct procedure is to:

- Ans**
- ☐ 1. Connect the Megger directly across the power supply terminals
 - ☒ 2. Isolate and de-energize the circuit completely before testing
 - ☐ 3. Connect the Megger in series with the load
 - ☐ 4. Use the lowest voltage range to avoid tripping breakers

Q.14 The output of a 4-to-1 MUX is _____.

- Ans**
- ☐ 1. Always 0
 - ☒ 2. The value of the selected input
 - ☐ 3. The value of the unselected inputs
 - ☐ 4. Always 1

Q.15 Which of the following logic gates is not used in the implementation of a full adder?

- Ans**
- ☒ 1. NOT gate
 - ☐ 2. AND gate
 - ☐ 3. OR gate
 - ☐ 4. XOR gate

Q.16 The average demand of power generating station is calculated as _____.

- Ans**
- ☒ 1. load factor × maximum demand
 - ☐ 2. plant factor × maximum demand
 - ☐ 3. maximum demand / load factor
 - ☐ 4. load factor / maximum demand

Q.17 Three inductors of 2 H, 3 H, and 6 H are connected in series in a circuit. There is no mutual coupling between them. The total inductance of the combination is:

- Ans**
- ☒ 1. 11 H
 - ☐ 2. 10 H
 - ☐ 3. 1 H
 - ☐ 4. 36 H

Q.18 Lenz's law essentially defines the:

- Ans**
- ☐ 1. Frequency of the induced EMF
 - ☐ 2. Magnitude of the induced EMF
 - ☒ 3. Polarity of the induced EMF
 - ☐ 4. Energy loss due to eddy currents

Q.19 A first-order pressure transducer has a time constant (τ) of 0.1 seconds. If the pressure changes as a step input from 0 Pa to 100 Pa, what is the dynamic error in the transducer's reading at time $t = 0.1$ seconds after the change?

(Use the response of a first-order system: $V(t) = V_f(1 - e^{-t/\tau})$ and $(1/e) = 0.3679$)

- Ans**
- ☒ 1. ≈ 13.5 Pa
 - ☒ 2. ≈ 63.2 Pa
 - ☒ 3. ≈ 36.8 Pa
 - ☒ 4. ≈ 86.5 Pa

Q.20 In a practical half-wave rectifier AC voltmeter circuit, a resistor is connected in series with the PMMC meter movement. Its primary function is to:

- Ans**
- ☒ 1. Block the reverse voltage across the diode.
 - ☒ 2. Limit the current and set the full-scale voltage range.
 - ☒ 3. Provide a path for the negative half-cycle.
 - ☒ 4. Filter the ripple in the rectified output.

Section : **Discipline2**

Q.1 Space-Height ratio of illumination is defined as the ratio of:

- Ans**
- ☒ 1. horizontal distance between adjacent lamps to height of lamp mountings
 - ☒ 2. mean horizontal candle power to its mean spherical candle power
 - ☒ 3. mean spherical candle power to its mean horizontal candle power
 - ☒ 4. height of lamp mounting to horizontal distance between adjacent lamps

Q.2 The earth leakage circuit breaker _____.

- Ans**
- ☒ 1. detects the leakage current of the circuit only
 - ☒ 2. both detects the earth leakage and disconnects the circuit from supply
 - ☒ 3. disconnects the circuit during earth leakage only
 - ☒ 4. restricts the overloading of the circuit

Q.3 In biomass plants, the gasification process converts solid biomass into _____.

- Ans**
- ☒ 1. combustible fuel gases
 - ☒ 2. noble gases
 - ☒ 3. toxic gases
 - ☒ 4. natural gases

Q.4 Which of the following traction systems has lowest efficiency?

- Ans**
- ☒ 1. Steam Locomotive
 - ☒ 2. Gas turbine Electric locomotive
 - ☒ 3. Diesel Electric locomotive
 - ☒ 4. Electric locomotive with hydro electric power plant

Q.5 A thyristor is a/an:

- Ans**
- ☒ 1. Linear device
 - ☒ 2. Passive device
 - ☒ 3. Uncontrolled switch
 - ☒ 4. Controlled switch

Q.6 To obtain a step angle of 6° for a 3-phase permanent magnet stepper motor, the rotor should have:

- Ans**
- ☒ 1. 20 poles
 - ☒ 2. 40 poles
 - ☒ 3. 30 poles
 - ☒ 4. 60 poles

Q.7 If a hydel power plant has generator efficiency of 0.6 and turbine efficiency of 0.7, the combined plant efficiency is _____.

- Ans**
- ☐ 1. 0.26
 - ☒ 2. 0.42
 - ☐ 3. 0.13
 - ☐ 4. 0.1

Q.8 A commercial building has 20 electrical points and 2 distribution boards. The cost of wiring one point (material + labour) is ₹1,000, and the cost of one distribution board (switches, busbar, frame) is ₹12,000. Labour for making each distribution board is 10% of the board's material cost. If a 10% contingency is added on the total cost, what is the final estimated cost of the electrical installation?

- Ans**
- ☒ 1. ₹51,040
 - ☐ 2. ₹38,000
 - ☐ 3. ₹36,500
 - ☐ 4. ₹53,200

Q.9 Why does the turbine in a gas power plant need to drive the compressor?

- Ans**
- ☐ 1. To reduce power consumption
 - ☐ 2. To increase the pressure of exhaust gases
 - ☐ 3. To store mechanical energy
 - ☒ 4. To maintain continuous airflow for combustion

Q.10 Because of its digital-to-motion behavior, a stepper motor is most suitable for:

- Ans**
- ☐ 1. Hydraulic control systems
 - ☐ 2. Pneumatic controllers
 - ☒ 3. Microprocessor-based systems
 - ☐ 4. Analog control systems

Q.11 Resistance of transmission line conductor is responsible for _____ in a transmission line.

- Ans**
- ☐ 1. proximity effect
 - ☒ 2. power loss
 - ☐ 3. ferranti effect
 - ☐ 4. flux linkage

Q.12 Providing spare sub-circuits in commercial buildings is mainly for:

- Ans**
- ☐ 1. Energy saving
 - ☒ 2. Future expansion and load increase
 - ☐ 3. Decorative purpose
 - ☐ 4. Reducing cost

Q.13 The feedback device in a servomotor system (like potentiometer or encoder) is mounted on:

- Ans**
- ☐ 1. Stator
 - ☐ 2. Commutator
 - ☒ 3. Rotor shaft
 - ☐ 4. Brushes

Q.14 Core-balance transformer is used to detect which of the following faults in a power transformer?

- Ans**
- ☐ 1. Overfluxing fault
 - ☐ 2. Overcurrent fault
 - ☐ 3. Overvoltage fault
 - ☒ 4. Earth fault

Q.15 Efficiency of transmission increases with _____ in transmission voltage and hence cost of copper in the cable _____.

- Ans**
- ☐ 1. decrease, increases
 - ☒ 2. increase, decreases
 - ☐ 3. increase, increases
 - ☐ 4. decrease, decreases

Q.16 The fault current during a symmetrical fault in power system is _____.

- Ans**
- ☐ 1. independent of system impedance
 - ☒ 2. inversely proportional to the total impedance of the system up to the point of the fault
 - ☐ 3. directly proportional to system impedance
 - ☐ 4. inversely proportional to system voltage

Q.17 What is the primary challenge in Class E commutation?

- Ans**
- ☐ 1. High cost of inductors
 - ☐ 2. High holding current
 - ☐ 3. Need for zero load current
 - ☒ 4. Generation and timing of external pulse

Q.18 The main switching device used in a Type-A chopper for low power and high frequency applications is:

- Ans**
- ☐ 1. Capacitor
 - ☐ 2. Diode only
 - ☒ 3. MOSFET or IGBT
 - ☐ 4. Transformer

Q.19 Which of the following methods is NOT used for controlling the temperature of a furnace?

- Ans**
- ☒ 1. By controlling the distribution of heat within the chamber
 - ☐ 2. By varying resistance of element
 - ☐ 3. By varying ratio of ON and OFF time of supply
 - ☐ 4. By varying applied voltage

Q.20 Which of the following is/are necessary parameters to cause Ferranti effect?

- Ans**
- ☐ 1. Resistance and Capacitance only.
 - ☐ 2. Resistance and Inductance only.
 - ☐ 3. Capacitance only.
 - ☒ 4. Inductance and Capacitance only.

Section : **Discipline3**

Q.1 What kind of steam is commonly used for drying paper in paper mills?

- Ans**
- ☐ 1. Condensed steam
 - ☐ 2. Superheated steam
 - ☐ 3. Wet steam
 - ☒ 4. Saturated steam

Q.2 Why is a magneto ignition system preferred in high-performance racing engines?

- Ans**
- ☐ 1. It reduces fuel consumption by limiting spark duration.
 - ☐ 2. It uses a distributor to control spark timing.
 - ☐ 3. It relies on the vehicle's battery for consistent spark.
 - ☒ 4. It generates higher voltage at high RPMs without external power.

Q.3 Standard applications of evaporative condensers involve:

- Ans**
- ☒ 1. Refrigeration systems
 - ☐ 2. Hydroelectric plants
 - ☐ 3. Wind turbines
 - ☐ 4. Steam turbines

Q.4 Which of the following is a measure of the time it takes for the system's response to reach its first peak?

- Ans**
- ☒ 1. Peak Time
 - ☐ 2. Settling Time
 - ☐ 3. Rise Time
 - ☐ 4. Delay Time

Q.5 Which operation is performed using a screw jack?

- Ans**
- ☒ 1. Lifting cars
 - ☐ 2. Grinding
 - ☐ 3. Cutting
 - ☐ 4. Polishing

Q.6 Calculate the Fourier number for transient heat conduction when the time is 0.5 s, the characteristic length is 0.1 m, and the thermal diffusivity is $1 \times 10^{-5} \text{ m}^2/\text{s}$.

- Ans**
- ☐ 1. 1
 - ☐ 2. 0.5
 - ☐ 3. 0.02
 - ☒ 4. 0.0005

Q.7 Which of the following is part of an IC Engine?

- Ans**
- ☐ 1. Brakes
 - ☐ 2. Suspension system
 - ☒ 3. Flywheel
 - ☐ 4. Audio system of a car

Q.8 Which device controls the flow in non-Pelton impulse turbines?

- Ans**
- ☐ 1. Servo motor
 - ☒ 2. Needle valve
 - ☐ 3. Draft tube
 - ☐ 4. Guide vane

Q.9 Which of the following is generally considered as an SI engine?

- Ans**
- ☐ 1. Diesel engine
 - ☐ 2. Gas engine
 - ☒ 3. Petrol engine
 - ☐ 4. Coal engine

Q.10 What is one of the fundamental assumptions made in the 3D heat conduction equation?

- Ans**
- ☒ 1. Homogeneous material
 - ☐ 2. Non-conductive material
 - ☐ 3. Constant heat flux
 - ☐ 4. Constant temperature

Q.11 In an RC circuit, what happens to the voltage across the resistor immediately after the switch is closed?

- Ans**
- ☒ 1. It is equal to the supply voltage
 - ☐ 2. It depends on the capacitance value
 - ☐ 3. It is half of the supply voltage
 - ☐ 4. It is zero

Q.12 What is the relationship between the roots of the characteristic equation and the free response of a system?

- Ans**
- ☒ 1. The roots determine the system's steady-state response
 - ☒ 2. The roots determine the system's natural frequency and damping ratio
 - ☒ 3. The roots determine the system's forced response
 - ☒ 4. The roots determine the system's transfer function

Q.13 What is the standard international (SI) unit for measuring the modulus of resilience?

- Ans**
- ☒ 1. Joules per cubic metre
 - ☒ 2. Joules
 - ☒ 3. Joules per metre
 - ☒ 4. Joules per square metre

Q.14 The fluid characteristics assumed in Bernoulli's equation are:

- Ans**
- ☒ 1. Viscous
 - ☒ 2. Elastic
 - ☒ 3. Incompressible
 - ☒ 4. Compressible

Q.15 What is the engine displacement of a 4-stroke single cylinder CI engine with a bore of 90 mm and a stroke of 100 mm?

- Ans**
- ☒ 1. 636 cc
 - ☒ 2. 600 cc
 - ☒ 3. 1500 cc
 - ☒ 4. 900 cc

Q.16 Which of the following is a primary advantage of the Root Locus Technique (RLT)?

- Ans**
- ☒ 1. It provides a graphical representation of the system's frequency response.
 - ☒ 2. It provides a detailed time-domain response of the system.
 - ☒ 3. It helps in determining the system's response to a step input.
 - ☒ 4. It allows for the analysis of the system's poles and zeros as a parameter (e.g., gain) varies.

Q.17 Find the mechanical advantage when a screw jack has pitch 5 mm and handle length 40 cm.

- Ans**
- ☒ 1. 80
 - ☒ 2. 503
 - ☒ 3. 120
 - ☒ 4. 160

Q.18 Which boundary condition fits a situation where the thermal flux is known?

- Ans**
- ☒ 1. Mixed
 - ☒ 2. Neumann
 - ☒ 3. Periodic
 - ☒ 4. Dirichlet

Q.19 The velocity profile of the laminar boundary layer is:

- Ans**
- ☒ 1. Parabolic-like
 - ☒ 2. Uniform
 - ☒ 3. Linear
 - ☒ 4. Logarithmic

Q.20 How many nozzles are commonly used in a cross-flow turbine?

- Ans**
- ☒ 1. Four
 - ☒ 2. Six
 - ☒ 3. Five
 - ☒ 4. One

Q.1 Centrifugal tension in a belt:

- Ans**
- ☒ 1. increases with square of belt speed
 - ☐ 2. acts opposite to belt motion
 - ☐ 3. decreases with belt speed
 - ☐ 4. is independent of mass density

Q.2 When a load acts at an eccentric distance (e) from the centroidal axis of a section, it produces:

- Ans**
- ☐ 1. Only bending stress
 - ☐ 2. Shear stress only
 - ☒ 3. Direct stress and bending stress simultaneously
 - ☐ 4. Only direct stress

Q.3 For a belt drive, the condition for maximum power transmission is:

- Ans**
- ☐ 1. Tension in tight side = 2 × centrifugal tension
 - ☐ 2. Tension in slack side = tight side
 - ☐ 3. Centrifugal tension = tight side tension
 - ☒ 4. Tension in tight side = 3 × centrifugal tension

Q.4 In a hydraulic power steering system, how is additional steering assistance provided to the driver?

- Ans**
- ☐ 1. By using a friction-based clutch mechanism to support steering effort
 - ☐ 2. By supplying compressed air through a pneumatic assist arrangement
 - ☐ 3. By increasing the mechanical advantage through modified linkages
 - ☒ 4. By applying hydraulic pressure to a piston that supports the steering linkage

Q.5 A mild-steel bar is subjected to a gradually applied axial load within its elastic limit. What is the nature of energy stored in the bar due to this load?

- Ans**
- ☐ 1. Kinetic energy
 - ☒ 2. Elastic strain energy
 - ☐ 3. Plastic deformation energy
 - ☐ 4. Heat energy

Q.6 What is the main goal of JIT (Just-in-Time) systems?

- Ans**
- ☐ 1. To isolate each production process as a standalone unit
 - ☐ 2. To maximize inventory levels so demand is always met
 - ☒ 3. To produce goods only when they are needed, and in the quantity needed
 - ☐ 4. To increase lead time so suppliers deliver earlier

Q.7 The transmission system in an automobile performs which of the following functions?

- Ans**
- ☐ 1. Only connects the engine and the wheels during motion
 - ☐ 2. Controls the cooling process of the engine system
 - ☐ 3. Only controls the steering motion of the vehicle
 - ☒ 4. Delivers power with the required torque and speed

Q.8 Which of the following contributes most significantly to the total cost in arc welding fabrication?

- Ans**
- ☐ 1. Edge preparation and setup
 - ☐ 2. Power consumption per weld
 - ☐ 3. Cost of electrode only
 - ☒ 4. Labour cost

Q.9 In the hardening process of steel, rapid quenching after heating results in -

- Ans**
- ☐ 1. Increase in toughness
 - ☒ 2. Formation of martensite
 - ☐ 3. Formation of pearlite
 - ☐ 4. Removal of carbon from surface

Q.10 In the sinking fund method of depreciation, the money set aside annually is:

- Ans**
- ☐ 1. An amount equal to the yearly depreciation requirement
 - ☐ 2. An amount deducted directly from the annual profit margin
 - ☐ 3. An amount deposited without earning any interest return
 - ☒ 4. An amount invested externally to accumulate with interest

Q.11 Which of the following best describes job training?

- Ans**
- ☒ 1. Training where the trainee learns while doing the actual job under supervision
 - ☐ 2. Formal lectures in a training school
 - ☐ 3. Training conducted in a classroom away from the work site
 - ☐ 4. Web-based training without doing real work

Q.12 One limitation of wind energy is that the power available from wind is proportional to which of the following?

- Ans**
- ☐ 1. The square of the wind speed
 - ☐ 2. The wind speed
 - ☒ 3. The cube of the wind speed
 - ☐ 4. The wind speed times the blade length

Q.13 Which of the following factors has the greatest influence in selecting a grinding wheel for a particular job?

- Ans**
- ☐ 1. Type of machine used
 - ☒ 2. Workpiece material and hardness
 - ☐ 3. Coolant application method
 - ☐ 4. Size of wheel

Q.14 A parallel fillet weld is predominantly designed for which type of stress?

- Ans**
- ☐ 1. Compressive stress across the throat
 - ☒ 2. Shear stress across the throat
 - ☐ 3. Bending stress in the weld throat
 - ☐ 4. Tensile stress across the throat

Q.15 Which type of line is used to represent an indication (indic) line in technical drawings?

- Ans**
- ☐ 1. Continuous wide line
 - ☒ 2. Chain thin line
 - ☐ 3. Dashed thin line
 - ☐ 4. Long-dash dotted line

Q.16 Which type of drill is mostly used for general-purpose drilling in mild steel?

- Ans**
- ☐ 1. Spade drill
 - ☒ 2. Twist drill
 - ☐ 3. Flat drill
 - ☐ 4. Centre drill

Q.17 In the cyaniding process, steel parts are heated in a bath containing:

- Ans**
- ☐ 1. Sodium chloride
 - ☐ 2. Graphite powder
 - ☐ 3. Calcium carbide
 - ☒ 4. Sodium cyanide and barium chloride

Q.18 In a compound gear train, how is the overall speed ratio of the system determined?

- Ans
- ☐ 1. By adding the individual gear ratios of the gear pairs
 - ☐ 2. By taking the reciprocal of the overall gear ratio
 - ☒ 3. By multiplying the individual gear ratios of each gear pair
 - ☐ 4. By taking the ratio of the largest gear's teeth to the smallest gear's teeth

Q.19 In a rack-and-pinion steering system, the rotary motion of the steering wheel is converted into:

- Ans
- ☐ 1. Oscillating motion of the pitman arm
 - ☐ 2. Vertical motion of the drag link in the mechanism
 - ☒ 3. Linear motion of the rack that moves the tie-rods
 - ☐ 4. Angular motion of the steering column shaft

Q.20 In a CAD system graphics terminal, which of the following is a typical display technique?

- Ans
- ☐ 1. Magnetic core display
 - ☒ 2. Raster-scan display
 - ☐ 3. Pulsewidth modulation display
 - ☐ 4. Thermal-printer display

Section : **Discipline5**

Q.1 What is the *Capacity Factor* of a power plant?

- Ans
- ☐ 1. Ratio of connected load to maximum demand
 - ☐ 2. Time fraction the plant is under maintenance
 - ☐ 3. Ratio of maximum demand to installed capacity
 - ☒ 4. Ratio of actual energy produced to (rated capacity × time)

Q.2 If $\frac{dy}{dx} = 2x$ and the curve passes through the point (1,5), then what is the particular solution?

- Ans
- ☒ 1. $y = x^2 + 4$
 - ☐ 2. $y = x^2 + 3$
 - ☐ 3. $y = 2x^2 + 5$
 - ☐ 4. $y = 2x^2 + 1$

Q.3 What is the value of the determinant of the matrix $\begin{bmatrix} 2 & 1 \\ 0 & 3 \end{bmatrix}$?

- Ans
- ☐ 1. 10
 - ☐ 2. 1
 - ☐ 3. 2
 - ☒ 4. 6

Q.4 Which of the following is a key requirement for achieving interchangeability in manufacturing?

- Ans
- ☐ 1. Using loose tolerances for all parts
 - ☐ 2. Assembling each part individually by manual fitting
 - ☒ 3. Following standardised dimensions and tolerances
 - ☐ 4. Allowing unlimited variation in component sizes

Q.5 If a physical quantity is independent of mass and time but depends on length, which could be its dimensional formula?

- Ans
- ☐ 1. $M L T^{-2}$
 - ☒ 2. L^n
 - ☐ 3. M^n
 - ☐ 4. T^n

Q.6 The area of the triangle with vertices (1, 2), (3, 4), (5, 6) is _____.

- Ans**
- ☒ 1. 0
 - ☐ 2. 6
 - ☐ 3. 4
 - ☐ 4. 2

Q.7 Which of the following correctly defines the atomic number (Z) of an atom?

- Ans**
- ☐ 1. The total number of electrons in the outermost shell
 - ☒ 2. The total number of protons in the nucleus only
 - ☐ 3. The total number of neutrons in the nucleus only
 - ☐ 4. The total number of protons and neutrons in the nucleus

Q.8 Which auxiliary system is essential for starting a large gas turbine?

- Ans**
- ☐ 1. Cooling water pump only
 - ☐ 2. Condenser vacuum pump
 - ☐ 3. Fuel atomizer
 - ☒ 4. Starter motor / starting mechanism

Q.9 In the design of machine elements, the form and size of parts are influenced primarily by:

- Ans**
- ☐ 1. The colour of the material
 - ☐ 2. The date of manufacture
 - ☐ 3. The marketing department's choice
 - ☒ 4. The loading conditions and permissible stresses

Q.10 The slope of the tangent to the curve $y = x^2$ at $x = 2$ is _____.

- Ans**
- ☒ 1. 4
 - ☐ 2. 3
 - ☐ 3. 2
 - ☐ 4. 0

Q.11 In the context of the evaporator of a refrigeration system, what is the “refrigerating effect”?

- Ans**
- ☐ 1. The heat added in the expansion device
 - ☐ 2. The heat rejected by the condenser
 - ☐ 3. The work done by the compressor
 - ☒ 4. The heat absorbed in the evaporator by the refrigerant

Q.12 In refrigeration system, the refrigerant with high latent heat will:

- Ans**
- ☐ 1. Increase compressor power
 - ☐ 2. Require more mass flow rate
 - ☐ 3. Produce less refrigeration effect
 - ☒ 4. Produce more refrigeration effect

Q.13 Which of the following options is the correct differential equation for $y = ae^{-2x} + be^x$?

- Ans**
- ☒ 1. $y'' + y' - 2y = 0$
 - ☐ 2. $y'' - y' - 2y = 0$
 - ☐ 3. $y'' - y' + 2y = 0$
 - ☐ 4. $y'' + y' + 2y = 0$

Q.14 What is the term used for the increase in dimensions of a solid body due to a rise in its temperature?

- Ans**
- ☐ 1. Thermal conductivity
 - ☒ 2. Thermal expansion
 - ☐ 3. Elastic deformation
 - ☐ 4. Plasticity

Q.15 Which of the following observations confirms that ethanoic acid is a weak acid but still shows typical acidic behavior?

- Ans
- ☐ 1. It reacts with sodium hydroxide to form hydrogen gas
 - ☐ 2. It does not conduct electricity even when dissolved in water
 - ☐ 3. It turns red litmus blue and neutralizes alkali
 - ☒ 4. It shows incomplete dissociation in water but reacts with carbonates to release CO_2

Q.16 Which statement is true for a capillary-tube expansion device (fixed restriction type)?

- Ans
- ☐ 1. It is used exclusively in large commercial refrigeration systems.
 - ☐ 2. It actively adjusts its opening to match load changes.
 - ☒ 3. Its flow area is fixed, so refrigerant charge must be exact for proper operation.
 - ☐ 4. It uses a sensing bulb to control flow.

Q.17 Which of the following is a major advantage of blending ethanol with petrol (gasohol)?

- Ans
- ☒ 1. It helps in complete combustion and reduces pollution
 - ☐ 2. It reduces fuel efficiency significantly
 - ☐ 3. It forms soot and smoke during combustion
 - ☐ 4. It increases engine noise

Q.18 What is the key material condition for the GO gauge according to Taylor's Principle?

- Ans
- ☒ 1. Maximum material condition (i.e., smallest hole or largest shaft)
 - ☐ 2. Intermediate material condition
 - ☐ 3. Minimum material condition (i.e., largest hole or smallest shaft)
 - ☐ 4. Material condition doesn't matter for GO gauge

Q.19 "Heat rate" of a power plant is best described as:

- Ans
- ☒ 1. The amount of heat input required to produce one kWh of electricity
 - ☐ 2. The fuel cost per kWh
 - ☐ 3. Time taken to heat the boiler from cold start
 - ☐ 4. The maximum thermal load the boiler can handle

Q.20 A parallel plate capacitor has plates of area A and separation d. If the charge on the plates is Q, what is the potential difference V between the plates?

- Ans
- ☐ 1. $V = Q/(\epsilon_0 d)$
 - ☐ 2. $V = QdA/(\epsilon_0)$
 - ☐ 3. $V = Q/(A d)$
 - ☒ 4. $V = Qd/(\epsilon_0 A)$

Test Date	23/02/2026
Test Time	9:00 AM - 11:00 AM
Subject	Junior Engineer Electrical Mechanical

Section : **General Awareness**

Q.1 At which of the following sites in Arunachal Pradesh was India's first commercial coal mine inaugurated in October 2025?

- Ans**
- ☒ 1. Tawang–Jang
 - ☒ 2. Ziro–Hapoli
 - ☒ 3. Namchik-Namphuk
 - ☒ 4. Itanagar–Naharlagun

Q.2 Which blood vessel carries oxygenated blood from the lungs to the heart?

- Ans**
- ☒ 1. Superior vena cava
 - ☒ 2. Aorta
 - ☒ 3. Pulmonary artery
 - ☒ 4. Pulmonary vein

Q.3 In which of the following states of India is the difference in literacy rate (as per the Census, 2011) between males and females the lowest?

- Ans**
- ☒ 1. Jharkhand
 - ☒ 2. Uttar Pradesh
 - ☒ 3. Rajasthan
 - ☒ 4. Kerala

Q.4 Which of the following authors created the fictional South Indian town of Malgudi and wrote *Swami and Friends*?

- Ans**
- ☒ 1. R. K. Narayan
 - ☒ 2. Premchand
 - ☒ 3. Raja Rao
 - ☒ 4. Mulk Raj Anand

Q.5 In September 2025, which of the following states of India launched AI-enabled screening devices for early detection of breast cancer, cervical cancer, and refractive errors?

- Ans**
- ☒ 1. Karnataka
 - ☒ 2. Punjab
 - ☒ 3. Maharashtra
 - ☒ 4. Gujarat

Q.6 Which reform measure played a key role in improving India's foreign exchange position after 1991?

- Ans**
- ☒ 1. Higher MSP for crops
 - ☒ 2. Reservation for small industries
 - ☒ 3. Devaluation of the rupee
 - ☒ 4. Nationalisation of banks

Q.7 Which of the following Articles of the Indian Constitution guarantees the right to life and personal liberty in India?

- Ans**
- ☒ 1. Article 21
 - ☒ 2. Article 32
 - ☒ 3. Article 19
 - ☒ 4. Article 14

Q.8	'The higher the better' is suitable in which of the following indicators of Human Development?
Ans	 1. Percentage of population below poverty line  2. Adult literacy rate  3. Infant mortality rate  4. Maternal mortality rate
Q.9	What is the main characteristic of tropical deciduous (monsoon) forests in India?
Ans	 1. Forests grow only above the snow-line  2. Trees shed leaves during the dry season  3. Trees remain evergreen all year  4. Vegetation is mostly cactus and xerophytes
Q.10	When was the Pradhan Mantri Mudra Yojana (PMMY) launched?
Ans	 1. 2009  2. 2015  3. 2004  4. 2014
Q.11	Which campaign did Gandhi lead specifically to protest the British salt tax?
Ans	 1. Dandi March  2. Quit India Movement  3. Non-Cooperation Movement  4. Swadeshi Campaign
Q.12	Which of the following queens led an armed resistance against the East India Company at Kittur (Karnataka) in 1824, against the implementation of the Doctrine of Lapse?
Ans	 1. Rani Avantibai  2. Rani Lakshmibai  3. Rani Chennamma  4. Rani Durgavati
Q.13	Which facility was inaugurated by AIIMS Raipur in September 2025, making it the first of its kind in a government hospital in Central India?
Ans	 1. Telemedicine call-centre  2. Digital diagnostics lab  3. Robotic surgery facility  4. Genomics sequencing facility
Q.14	Against which opponent did Jyothi Surekha Vennam clinch the bronze medal at the 2025 Archery World Cup Final?
Ans	 1. Mariana Bernal (Mexico)  2. Andrea Becerra (Mexico)  3. Ella Gibson (Great Britain)  4. Alexis Ruiz (USA)
Q.15	Borazine is popularly known as inorganic _____.
Ans	 1. detergent  2. graphite  3. benzene  4. diamond
Q.16	India's first-ever Archery League (Archery Premier League) was launched in 2025 by _____.
Ans	 1. National Archery Council of India (NACI)  2. Archery Federation of India (AFI)  3. Archery Association of India (AAI)  4. Indian Archery Committee (IAC)

Q.17 Pattachitra paintings are traditionally associated with which region?

- Ans**
-  1. Gujarat and Rajasthan
 -  2. Punjab and Haryana
 -  3. Odisha and West Bengal
 -  4. Kerala and Tamil Nadu

Q.18 Which of the following dynasties replaced the Mauryas in the Gangetic heartland by the late 2nd century BCE?

- Ans**
-  1. Satavahana
 -  2. Vakataka
 -  3. Shunga
 -  4. Kushana

Q.19 Which of the following Articles of the Indian Constitution gives a person the right to move the Supreme Court directly for enforcement of fundamental rights?

- Ans**
-  1. Article 14
 -  2. Article 19
 -  3. Article 32
 -  4. Article 16

Q.20 Which of the following union territories is made up of two main island groups in the Bay of Bengal?

- Ans**
-  1. Andaman and Nicobar Islands
 -  2. Lakshadweep
 -  3. Puducherry
 -  4. Dadra and Nagar Haveli and Daman and Diu

Section : **General Intelligence and Reasoning Ability**

Q.1 Based on the English alphabetical order, three of the following four letter cluster pairs are alike in a certain way and thus form a group. Which is the one that does not belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter cluster)

- Ans**
-  1. KQ - QV
 -  2. DJ - AG
 -  3. OU - LR
 -  4. GM - DJ

Q.2 Refer to the following letter series and answer the question that follows. Counting to be done from left to right only.

(Left) N Q L U H P I T J Y U I R H F W O A V N R X Z T F R L (Right)

How many such vowels are there, each of which is immediately preceded by a vowel and also immediately followed by a vowel?

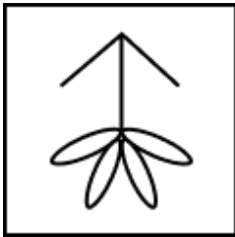
- Ans**
-  1. Two
 -  2. None
 -  3. One
 -  4. Three

Q.3 If the water source is placed along X-Y, as shown in the figure, which of the given options will be the water reflection of the given figure.

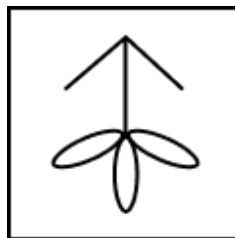


Ans

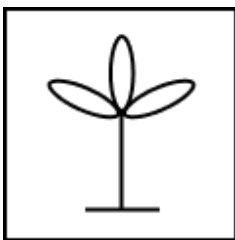
✗ 1.



✓ 2.



✗ 3.



✗ 4.



Q.4 Select the triad which follows the same pattern as that followed by the two triads given below. Both triads follow the same pattern.
LS-NV-QT
OV-QY-TW

- Ans
- ✗ 1. JP-KT-NR
 - ✗ 2. JP-KS-NR
 - ✗ 3. IP-KS-NR
 - ✓ 4. IP-KS-NQ

Q.5 In a certain code language, 'GRIP' is coded as '7542' and 'INKS' is coded as '1436'. What is the code for 'I' in the given code language?

- Ans
- ✗ 1. 2
 - ✓ 2. 4
 - ✗ 3. 1
 - ✗ 4. 3

Q.6 What will come in the place of the '?' in the following equation, if '+' and '-' are interchanged and 'x' and '÷' are interchanged?

$$31 - 21 + 13 \div 48 \times 24 = ?$$

- Ans**
- ☒ 1. 16
 - ☒ 2. 26
 - ☒ 3. 11
 - ☒ 4. 21

Q.7 In a certain code language,

A@ B means 'A is the daughter of B',
A # B means 'A is the brother of B',
A \$ B means 'A is the wife of B' and
A % B means 'A is the father of B'.

Based on the above, how is Diljit related to Kavya if 'Diljit @ Atul # Manav \$ Rohit % Kavya'?

- Ans**
- ☒ 1. Father's brother's daughter
 - ☒ 2. Mother's brother's wife
 - ☒ 3. Mother's brother's daughter
 - ☒ 4. Father's brother's wife

Q.8 A, E, Q, S, X, W and Z are sitting around a circular table facing the centre. Only one person sits between X and S when counted from the left of S. A sits third to the right of W. Z sits third to the left of Q. A sits to the immediate right of Z. E is not an immediate neighbour of Z. How many people sit between Q and Z when counted from the left of Z?

- Ans**
- ☒ 1. 3
 - ☒ 2. 2
 - ☒ 3. 1
 - ☒ 4. 4

Q.9 If 'E' stands for '+', 'F' stands for '-', 'G' stands for 'x' and 'H' stands for '÷', what will come in place of '?' in the following equation?
63 G 2 F 14 H 7 E 5 = ?

- Ans**
- ☒ 1. 127
 - ☒ 2. 129
 - ☒ 3. 125
 - ☒ 4. 131

Q.10 What should come in place of '?' in the given series?
74, 85, 107, 140, 184, ?

- Ans**
- ☒ 1. 241
 - ☒ 2. 235
 - ☒ 3. 237
 - ☒ 4. 239

Q.11 What should come in place of ? in the given series based on the English alphabetical order?
CID GMH KQL OUP ?

- Ans**
- ☒ 1. SYT
 - ☒ 2. SYU
 - ☒ 3. SZU
 - ☒ 4. SZT

Q.12 Maya is the wife of Gautam. Gautam is the brother of Manish. Manish is the father of Udita. Udita is the daughter of Prem. How is Maya related to Prem?

- Ans**
- ☒ 1. Brother's wife
 - ☒ 2. Husband's brother's wife
 - ☒ 3. Husband's brother's daughter
 - ☒ 4. Brother's daughter

Q.13 What should come in place of ? in the given series based on the English alphabetical order?
AFI EJM INQ MRU ?

- Ans**
- ☐ 1. QUY
 - ☐ 2. QUZ
 - ☒ 3. QVY
 - ☐ 4. QVZ

Q.14 Refer to the given letter, symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) # \$ % # Y + U Q R M K V M N J ? H N (Right)

How many such letters are there, each of which is immediately preceded by a symbol and also immediately followed by a letter?

- Ans**
- ☐ 1. One
 - ☐ 2. Four
 - ☒ 3. Two
 - ☐ 4. Three

Q.15 Select the pair which follows the same pattern as that followed by the two set of pairs given below. Both pairs follow the same pattern.

SRQ–NML
ONM–JIH

- Ans**
- ☐ 1. CBA–WWU
 - ☐ 2. CAY–WVU
 - ☒ 3. CBA–XWV
 - ☐ 4. CAY–XWV

Q.16 A, D, F, G, H and S live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on till the topmost floor is numbered 6. F lives on a floor which is a prime number. The product of floors on which F and D live is 8. H lives immediately above G. The sum of floors on which D and S lives is 7. Who lives immediately above F?

- Ans**
- ☒ 1. S
 - ☐ 2. H
 - ☐ 3. D
 - ☐ 4. A

Q.17 Select the set in which the numbers are related in the same way as are the numbers of the following sets.

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding to/subtracting from/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

(6, 3, 27)
(5, 2, 14)

- Ans**
- ☐ 1. (17, 7, 102)
 - ☐ 2. (15, 4, 82)
 - ☒ 3. (14, 4, 72)
 - ☐ 4. (11, 6, 96)

Q.18 Based on the English alphabetical order, three of the following four letter cluster pairs are alike in a certain way and thus form a group. Which is the one that does not belong to that group?

(Note: The odd man out is not based on the number of consonants/vowels or their position in the letter cluster)

- Ans**
- ☐ 1. NL – QO
 - ☐ 2. VT – YW
 - ☒ 3. IG – MJ
 - ☐ 4. CA – FD

Q.19 Refer to the following letter series and answer the question. **Counting to be done from left to right only.**

(Left) P E A A H L S A X O E A A J F H A B X A S V (Right)

How many such consonants are there each of which is immediately preceded by a consonant and also immediately followed by a vowel?

- Ans
-  1. 5
 -  2. 4
 -  3. 2
 -  4. 3

Q.20 26 is related to 106 following a certain logic. Following the same logic, 32 is related to 130. To which of the following is 42 related, following the same logic?
(NOTE : Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g. 13 – Operations on 13 such as adding /subtracting /multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed)

- Ans
-  1. 171
 -  2. 172
 -  3. 173
 -  4. 170

Section : **Arithmetical and Numerical Ability**

Q.1 If $57 \div 19 \times 4^2 - 16 \times 8 \div 4 + 8 = z$, then find value of z.

- Ans
-  1. 20
 -  2. 24
 -  3. 34
 -  4. 19

Q.2 A number, when increased by 130%, gives 2990. The number is:

- Ans
-  1. 3900
 -  2. 650
 -  3. 2600
 -  4. 1300

Q.3 A dealer purchased a grinder for ₹7660 and sold it for ₹8426. He had allowed a discount of 12% on its marked price. What was the difference between the cost price and marked price (in ₹) of the grinder?

- Ans
-  1. 1950
 -  2. 2005
 -  3. 1915
 -  4. 1750

Q.4 A woman sells a saree at a profit of 20%. If she had bought it for 20% less and sold it for ₹40 less, she would have gained 40%. Find the cost price of the saree.

- Ans
-  1. ₹1,200
 -  2. ₹1,050
 -  3. ₹750
 -  4. ₹500

Q.5 A student's marks were incorrectly entered as 41 instead of 86. Due to this, the average marks of the class got decreased by $\frac{5}{3}$.

What is the number of students in the class?

- Ans
-  1. 29
 -  2. 27
 -  3. 18
 -  4. 26

Q.6 A boy rides on his bike from his home to college which is at a distance of 13.5 km at an average speed of 25 km/hr and returns back to home at a speed of 20 km/hr. Find the average speed for the entire journey. (Round off your answer to two decimal places).

- Ans**
- ☒ 1. 22.22 km/hr
 - ☐ 2. 23.85 km/hr
 - ☐ 3. 22.95 km/hr
 - ☐ 4. 22.50 km/hr

Q.7 Simplify: $(106 + 54) \div [25 \times \{2 \times (5 + 3)\}] - 3$

- Ans**
- ☒ 1. -2.6
 - ☐ 2. 1.8
 - ☐ 3. -3
 - ☐ 4. 0.4

Q.8 Coffee powder worth ₹574 per kg and ₹810 per kg are mixed with a third variety in the ratio 1 : 1 : 2. If the mixture is worth ₹750 per kg, find the price of the third variety per kg.

- Ans**
- ☐ 1. ₹845
 - ☐ 2. ₹783
 - ☒ 3. ₹808
 - ☐ 4. ₹770

Q.9 A and B can complete a work in 11 days and 22 days, respectively. They started doing the work together, but after 2 days, B had to leave, and A completed the remaining work alone. The whole work was completed in _____ (days).

- Ans**
- ☐ 1. 9
 - ☐ 2. 11
 - ☐ 3. 8
 - ☒ 4. 10

Q.10 In a division sum, the divisor is 20 times the quotient and 5 times the remainder. If the remainder is 72, what is the dividend?

- Ans**
- ☐ 1. 6550
 - ☒ 2. 6552
 - ☐ 3. 6551
 - ☐ 4. 6554

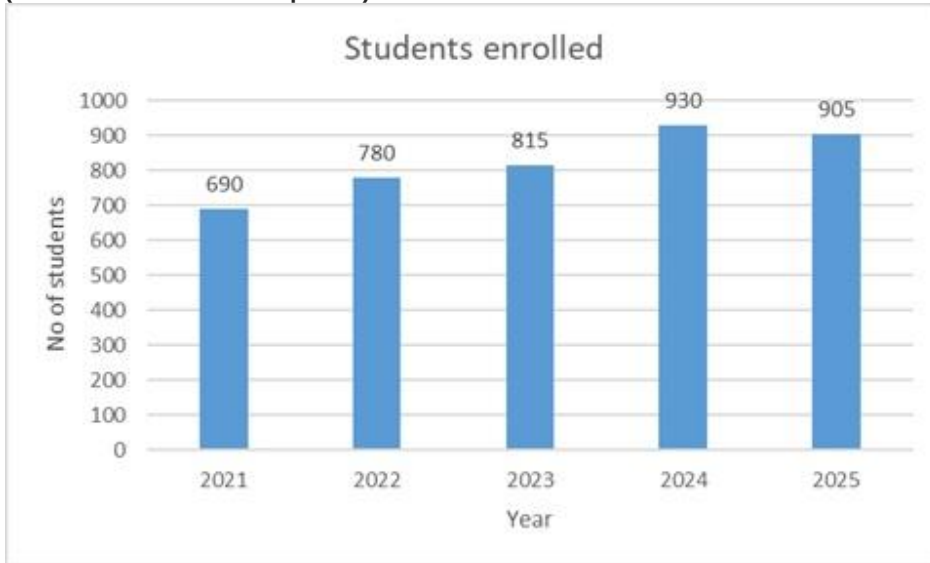
Q.11 A shopkeeper offers the following schemes on toys, all having the same marked price.
(A) Successive discounts of 15% and 35% on any number of toys bought.
(B) Successive discounts of 24%, 31%, and 20% on any number of toys bought.
(C) A discount of 25% on the first 5 toys and a discount of 11% on each toy thereafter.
(D) Seven toys free of cost on buying seven toys. A customer wants to buy 7 toys.
Which of the above schemes is the least beneficial to her?

- Ans**
- ☐ 1. B
 - ☐ 2. A
 - ☒ 3. C
 - ☐ 4. D

Q.12 The ratio of the number of boys to girls in a school is 5 : 3. If there are 160 more boys than girls, find the number of girls in the school.

- Ans**
- ☐ 1. 200
 - ☒ 2. 240
 - ☐ 3. 160
 - ☐ 4. 220

Q.13 The following bar graph shows the details of the number of students enrolled in a pharmacy college during the consecutive five years. In which year did the enrollment increase the maximum as compared to the previous year and also find the percentage (round off to two decimal places) increase?



- Ans
- ☒ 1. During the year 2023 by 13.08%
 - ☒ 2. During the year 2024 by 14.11%
 - ☒ 3. During the year 2021 by 16.67%
 - ☒ 4. During the year 2022 by 15.04%

Q.14 What sum of money (in ₹) will yield ₹660 as simple interest in 2 years at 6% per annum?

- Ans
- ☒ 1. 5,000
 - ☒ 2. 5,900
 - ☒ 3. 5,500
 - ☒ 4. 5,700

Q.15 The difference between the compound interest (when interest is compounded annually) and the simple interest if ₹51,500 is deposited at 6% rate of interest per annum for 2 years is:

- Ans
- ☒ 1. ₹179.3
 - ☒ 2. ₹188.8
 - ☒ 3. ₹185.4
 - ☒ 4. ₹190.5

Q.16 Find the area of a triangle whose base is 18.6 cm and height is 10.4 cm.

- Ans
- ☒ 1. 100 cm²
 - ☒ 2. 80 cm²
 - ☒ 3. 96.72 cm²
 - ☒ 4. 90.50 cm²

Q.17 Anand purchased an item and incurred ₹138 in repair expenses. Subsequently, he sold it to Bharath with a 14% profit. Eventually, Bharath sold the item for ₹7,695, making a 55% loss. What was the cost (in ₹) of the item for Anand just before selling it to Bharath?

- Ans
- ☒ 1. 14,997
 - ☒ 2. 15,000
 - ☒ 3. 14,999
 - ☒ 4. 15,001

Q.18 Divide ₹2,478 into three parts in such a way that half of the first part, one-fourth of the second part and one-eighth of the third part are equal. What is the value of the third part (in ₹)?

- Ans**
- ☐ 1. 1,116
 - ☒ 2. 1,416
 - ☐ 3. 1,516
 - ☐ 4. 1,716

Q.19 How many spherical iron balls, each 12.6 cm in diameter, can be made from a rectangular solid of iron with dimensions 189 cm, 88 cm, and 63 cm? (Use $\pi = \frac{22}{7}$)

- Ans**
- ☐ 1. 1050
 - ☐ 2. 1650
 - ☒ 3. 1000
 - ☐ 4. 1270

Q.20 Two trains P and Q start from the same point in the same direction at the speeds of 120 km/h and 144 km/h, respectively. If the length of each train is 150 m, how long will it take for train Q to cross train P?

- Ans**
- ☐ 1. 30 seconds
 - ☐ 2. 60 seconds
 - ☒ 3. 45 seconds
 - ☐ 4. 120 seconds

Section : Hindi Language and Comprehension

Q.1 उपयुक्त क्रिया- विशेषण का चयन कर वाक्य पूर्ण करें-
यहाँ आदमी ईमानदार है ।

- Ans**
- ☒ 1. प्रत्येक
 - ☐ 2. विशेष
 - ☐ 3. कोई
 - ☐ 4. अवशेष

Q.2 दिए गए वाक्य में रिक्त स्थान के लिए उपयुक्त विशेषण चुनें ।
मुझे चाय दो ।

- Ans**
- ☒ 1. थोड़ी
 - ☐ 2. ठोड़ी
 - ☐ 3. थोड़े
 - ☐ 4. थोड़ा

Q.3 दिए गए वाक्यों में से वर्तनी की दृष्टि से शुद्ध वाक्य का चयन कीजिए ।

- Ans**
- ☐ 1. भरत भी राम के भाई थे ।
 - ☐ 2. भरथ भी राम के भाई थे ।
 - ☐ 3. भरत बी राम के भई थे ।
 - ☒ 4. भरत भी राम के भाई थे ।

Q.4 'देश में बड़े-बड़े उद्योगों को स्थापित करने की क्रिया' वाक्यांश के लिए सार्थक शब्द होगा -

- Ans**
- ☐ 1. उद्योत
 - ☒ 2. उद्योगीकरण
 - ☐ 3. उद्यानगोष्ठी
 - ☐ 4. उद्घासन

Q.5	दिए गये वाक्य में उचित कारक का प्रयोग करते हुए वाक्य पूर्ण करें- श्रवण कुमार अपने माता-पिता अनन्य भक्त थे ।
Ans	 1. को  2. पर  3. से  4. के
Q.6	निम्नलिखित अव्यवस्थित क्रम वाले वाक्यों को क,ख,ग,घ की संज्ञा दी गई है । इन्हें ध्यान से पढ़कर,दिए गए विकल्पों में से उचित वाक्य क्रम वाला विकल्प चुनिए, जिससे सही अनुच्छेद का निर्माण हो - क -जो पीढ़ियों से चली आ रही है और जिसका पालन किसी समाज या संस्कृति के अधिकांश लोग करते हैं । ख -परंपरा एक ऐसी प्रथा है । ग -केवल पारिवारिक या व्यक्तिगत स्तर पर ही उसका पालन किया जा सकता है । घ -जबकि एक रीति-रिवाज अल्पकालिक हो सकता है ।
Ans	 1. क ग ख घ  2. ग क ख घ  3. घ ग ख क  4. ख क घ ग
Q.7	दिए गए वाक्य के किस भाग में त्रुटि है? पुस्तकालय में बयस्क पाठकों के लिए विशेष अध्ययन कक्ष उपलब्ध है ।
Ans	 1. के लिए विशेष  2. अध्ययन कक्ष उपलब्ध है ।  3. बयस्क पाठकों  4. पुस्तकालय में
Q.8	वाक्य में रेखांकित शब्द का पर्यायवाची पहचानें- ' मैंने अपनी नई पुस्तक का <u>मसौदा</u> प्रकाशक को भेज दिया है । '
Ans	 1. अभिलिखित  2. पांडुलिपि  3. ख्याली  4. मसखरा
Q.9	दिये गये वाक्य को पूर्ण करने के लिए सबसे उपयुक्त क्रिया का चयन करें- छात्र उच्च शिक्षा के लिए विदेश में _____ हैं ।
Ans	 1. घूमते  2. सोते  3. खेलते  4. जाते
Q.10	'किसी नियम के अंतर्गत बना हुआ कोई और छोटा नियम' वाक्यांश के लिए सार्थक शब्द होगा -
Ans	 1. उपनायक  2. उपनिबंधक  3. उपनिधि  4. उपनियम
Q.11	निम्नलिखित विकल्पों में से वाक्य को उचित क्रम में लिखें- 1- एक वृहद उपन्यास है 2- गोदान प्रेमचन्द्र कृत 3- अत्यंत व्यापक है 4- जिसका वर्ण्य विषय
Ans	 1. 1,3, 4, 2  2. 2, 1, 4, 3  3. 4, 3, 2, 1  4. 3, 4, 2, 1

Q.12 “मक्खी पर मक्खी मारना” मुहावरे का अर्थ है ?

- Ans
-  1. मालदार आदमी बनना
 -  2. निरर्थक कार्य करना
 -  3. लाभ के स्थान पर हानि होना
 -  4. भेद खुलने की संभावना

Q.13 दिये गये वाक्य को पूर्ण करने के लिए सबसे उपयुक्त क्रिया-विशेषण का चयन करें-

2010 में मलेरिया से _____ छह लाख से अधिक मौतें हुईं ।

- Ans
-  1. लगभग
 -  2. गंभीर
 -  3. निस्संदेह
 -  4. अक्सर

Q.14 वाक्य में रेखांकित शब्द का पर्यायवाची पहचानें-
'मनुष्य की देह नाशवान है ।'

- Ans
-  1. बेसुध
 -  2. बिगाड़
 -  3. भयभीत
 -  4. क्षणभंगुर

Q.15 ‘किरकिरा हो जाना’ मुहावरे का क्या अर्थ है?

- Ans
-  1. बड़ा करना
 -  2. चले जाना
 -  3. बहुत दूर
 -  4. विघ्न पड़ना

Comprehension:

दिए गए गद्यांश के आधार पर पूछे गए प्रश्नों का उत्तर दीजिए ।

ऐसा देश, जिसमें प्रमुखतया मैदान हैं जो अच्छी तरह सिंचित हैं और जिन्हें वर्ष के अधिकांश भाग में पर्याप्त सूर्य का प्रकाश मिलता है; स्वाभाविक रूप से कृषि के लिए विशेष उपयुक्त होगा । इसीलिए अनंतकाल से भारत में कृषि लोगों का मुख्य धंधा रहा है । चूंकि देश के विभिन्न भागों के उत्पादनों में भिन्नता है, और ये स्वाभाविक जल मार्गों या सड़कों के द्वारा, जो बिना अधिक कठिनाई के निर्मित हो सकती हैं, एक स्थान से दूसरे स्थान को सरलतापूर्वक स्थानांतरित हो सकते हैं, आंतरिक व्यापार पर्याप्त मात्रा में विकसित हुआ । भूमिगत और समुद्री मार्गों के द्वारा वैदेशिक व्यापार भी बड़े पैमाने पर विकसित हुआ किंतु अनेक शताब्दियों तक यह व्यापार विदेशियों द्वारा ही किया जाता रहा । भारतीयों की स्वयं की इस क्षेत्र में बहुत कम भूमिका रही । बहुत संख्या में भारतीयों ने विदेशी व्यापार इसलिए तत्परता से नहीं अपनाया, क्योंकि देश के अंतः भाग समुद्र से काफी दूरी पर हैं । केवल समुद्र तट के क्षेत्र के लोगों ने कुछ मात्रा में समुद्री व्यापार प्रारंभ किया । इस तरह भौतिक विशेषताओं और शक्तियों के प्रभाव से भारतीय आर्थिक जीवन कृषि प्रधान रूप में विकसित हुआ और संपूर्ण रूप में, उसके सांस्कृतिक जीवन को बनाने में, इसका उल्लेखनीय असर पड़ा ।

SubQuestion No : 16

Q.16 दिए गए विकल्पों में से कौन-सा गद्यांश में प्रयुक्त ‘प्रधान’ शब्द का विलोम शब्द है?

- Ans
-  1. मुख्य
 -  2. गौण
 -  3. सर्वोच्च
 -  4. अप्रधान

Comprehension:

दिए गए गद्यांश के आधार पर पूछे गए प्रश्नों का उत्तर दीजिए ।

ऐसा देश, जिसमें प्रमुखतया मैदान हैं जो अच्छी तरह सिंचित हैं और जिन्हें वर्ष के अधिकांश भाग में पर्याप्त सूर्य का प्रकाश मिलता है; स्वाभाविक रूप से कृषि के लिए विशेष उपयुक्त होगा । इसीलिए अनंतकाल से भारत में कृषि लोगों का मुख्य धंधा रहा है । चूंकि देश के विभिन्न भागों के उत्पादनों में भिन्नता है, और ये स्वाभाविक जल मार्गों या सड़कों के द्वारा, जो बिना अधिक कठिनाई के निर्मित हो सकती हैं, एक स्थान से दूसरे स्थान को सरलतापूर्वक स्थानांतरित हो सकते हैं, आंतरिक व्यापार पर्याप्त मात्रा में विकसित हुआ । भूमिगत और समुद्री मार्गों के द्वारा वैदेशिक व्यापार भी बड़े पैमाने पर विकसित हुआ किंतु अनेक शताब्दियों तक यह व्यापार विदेशियों द्वारा ही किया जाता रहा । भारतीयों की स्वयं की इस क्षेत्र में बहुत कम भूमिका रही । बहुत संख्या में भारतीयों ने विदेशी व्यापार इसलिए तत्परता से नहीं अपनाया, क्योंकि देश के अंतः भाग समुद्र से काफी दूरी पर हैं । केवल समुद्र तट के क्षेत्र के लोगों ने कुछ मात्रा में समुद्री व्यापार प्रारंभ किया । इस तरह भौतिक विशेषताओं और शक्तियों के प्रभाव से भारतीय आर्थिक जीवन कृषि प्रधान रूप में विकसित हुआ और संपूर्ण रूप में, उसके सांस्कृतिक जीवन को बनाने में, इसका उल्लेखनीय असर पड़ा ।

SubQuestion No : 17

Q.17 दिए गए विकल्पों में से कौन-सा गद्यांश में प्रयुक्त ‘समुद्र’ शब्द का पर्यायवाची शब्द है?

- Ans
-  1. अंबुज
 -  2. जलज
 -  3. वारिधि
 -  4. भूमिज

Comprehension:

दिए गए गद्यांश के आधार पर पूछे गए प्रश्नों का उत्तर दीजिए।

ऐसा देश, जिसमें प्रमुखतया मैदान हैं जो अच्छी तरह सिंचित हैं और जिन्हें वर्ष के अधिकांश भाग में पर्याप्त सूर्य का प्रकाश मिलता है; स्वाभाविक रूप से कृषि के लिए विशेष उपयुक्त होगा। इसीलिए अनंतकाल से भारत में कृषि लोगों का मुख्य धंधा रहा है। चूंकि देश के विभिन्न भागों के उत्पादनों में भिन्नता है, और ये स्वाभाविक जल मार्गों या सड़कों के द्वारा, जो बिना अधिक कठिनाई के निर्मित हो सकती हैं, एक स्थान से दूसरे स्थान को सरलतापूर्वक स्थानांतरित हो सकते हैं, आंतरिक व्यापार पर्याप्त मात्रा में विकसित हुआ। भूमिगत और समुद्री मार्गों के द्वारा वैदेशिक व्यापार भी बड़े पैमाने पर विकसित हुआ किंतु अनेक शताब्दियों तक यह व्यापार विदेशियों द्वारा ही किया जाता रहा। भारतीयों की स्वयं की इस क्षेत्र में बहुत कम भूमिका रही। बहुत संख्या में भारतीयों ने विदेशी व्यापार इसलिए तत्परता से नहीं अपनाया, क्योंकि देश के अंतः भाग समुद्र से काफी दूरी पर हैं। केवल समुद्र तट के क्षेत्र के लोगों ने कुछ मात्रा में समुद्री व्यापार प्रारंभ किया। इस तरह भौतिक विशेषताओं और शक्तियों के प्रभाव से भारतीय आर्थिक जीवन कृषि प्रधान रूप में विकसित हुआ और संपूर्ण रूप में, उसके सांस्कृतिक जीवन को बनाने में, इसका उल्लेखनीय असर पड़ा।

SubQuestion No : 18

Q.18 गद्यांश के अनुसार, भारतीयों ने विदेशी व्यापार तत्परता से क्यों नहीं अपनाया?

- Ans
- ☒ 1. भारत के लोगों का मुख्य व्यवसाय कृषि रहा है।
 - ☒ 2. भारत की नदियों में जल की मात्रा में कमी है।
 - ☒ 3. भारतीय शास्त्रों में इसकी मनाही है।
 - ☒ 4. क्योंकि देश के अंतः भाग समुद्र से काफी दूरी पर हैं।

Comprehension:

दिए गए गद्यांश के आधार पर पूछे गए प्रश्नों का उत्तर दीजिए।

ऐसा देश, जिसमें प्रमुखतया मैदान हैं जो अच्छी तरह सिंचित हैं और जिन्हें वर्ष के अधिकांश भाग में पर्याप्त सूर्य का प्रकाश मिलता है; स्वाभाविक रूप से कृषि के लिए विशेष उपयुक्त होगा। इसीलिए अनंतकाल से भारत में कृषि लोगों का मुख्य धंधा रहा है। चूंकि देश के विभिन्न भागों के उत्पादनों में भिन्नता है, और ये स्वाभाविक जल मार्गों या सड़कों के द्वारा, जो बिना अधिक कठिनाई के निर्मित हो सकती हैं, एक स्थान से दूसरे स्थान को सरलतापूर्वक स्थानांतरित हो सकते हैं, आंतरिक व्यापार पर्याप्त मात्रा में विकसित हुआ। भूमिगत और समुद्री मार्गों के द्वारा वैदेशिक व्यापार भी बड़े पैमाने पर विकसित हुआ किंतु अनेक शताब्दियों तक यह व्यापार विदेशियों द्वारा ही किया जाता रहा। भारतीयों की स्वयं की इस क्षेत्र में बहुत कम भूमिका रही। बहुत संख्या में भारतीयों ने विदेशी व्यापार इसलिए तत्परता से नहीं अपनाया, क्योंकि देश के अंतः भाग समुद्र से काफी दूरी पर हैं। केवल समुद्र तट के क्षेत्र के लोगों ने कुछ मात्रा में समुद्री व्यापार प्रारंभ किया। इस तरह भौतिक विशेषताओं और शक्तियों के प्रभाव से भारतीय आर्थिक जीवन कृषि प्रधान रूप में विकसित हुआ और संपूर्ण रूप में, उसके सांस्कृतिक जीवन को बनाने में, इसका उल्लेखनीय असर पड़ा।

SubQuestion No : 19

Q.19 गद्यांश में 'सांस्कृतिक जीवन पर प्रभाव' किसका बताया गया है?

- Ans
- ☒ 1. विदेशी शासन का
 - ☒ 2. धार्मिक सुधारों का
 - ☒ 3. शिक्षा का
 - ☒ 4. आर्थिक जीवन का

Comprehension:

दिए गए गद्यांश के आधार पर पूछे गए प्रश्नों का उत्तर दीजिए।

ऐसा देश, जिसमें प्रमुखतया मैदान हैं जो अच्छी तरह सिंचित हैं और जिन्हें वर्ष के अधिकांश भाग में पर्याप्त सूर्य का प्रकाश मिलता है; स्वाभाविक रूप से कृषि के लिए विशेष उपयुक्त होगा। इसीलिए अनंतकाल से भारत में कृषि लोगों का मुख्य धंधा रहा है। चूंकि देश के विभिन्न भागों के उत्पादनों में भिन्नता है, और ये स्वाभाविक जल मार्गों या सड़कों के द्वारा, जो बिना अधिक कठिनाई के निर्मित हो सकती हैं, एक स्थान से दूसरे स्थान को सरलतापूर्वक स्थानांतरित हो सकते हैं, आंतरिक व्यापार पर्याप्त मात्रा में विकसित हुआ। भूमिगत और समुद्री मार्गों के द्वारा वैदेशिक व्यापार भी बड़े पैमाने पर विकसित हुआ किंतु अनेक शताब्दियों तक यह व्यापार विदेशियों द्वारा ही किया जाता रहा। भारतीयों की स्वयं की इस क्षेत्र में बहुत कम भूमिका रही। बहुत संख्या में भारतीयों ने विदेशी व्यापार इसलिए तत्परता से नहीं अपनाया, क्योंकि देश के अंतः भाग समुद्र से काफी दूरी पर हैं। केवल समुद्र तट के क्षेत्र के लोगों ने कुछ मात्रा में समुद्री व्यापार प्रारंभ किया। इस तरह भौतिक विशेषताओं और शक्तियों के प्रभाव से भारतीय आर्थिक जीवन कृषि प्रधान रूप में विकसित हुआ और संपूर्ण रूप में, उसके सांस्कृतिक जीवन को बनाने में, इसका उल्लेखनीय असर पड़ा।

SubQuestion No : 20

Q.20 दिये गए विकल्पों में से गद्यांश के केंद्रीय विषय का चुनाव कीजिए-

- Ans
- ☒ 1. इसमें भारत को एक वैश्विक शक्ति के रूप में प्रदर्शित किया गया है।
 - ☒ 2. इसमें भारत के एक कृषि प्रधान देश होने के कारणों पर चर्चा की गई है।
 - ☒ 3. यह भारत में कमजोर विदेशी व्यापार के विषय में है।
 - ☒ 4. इसमें भारत के जलमार्गों के विकास की आवश्यकता को दर्शाया गया है।

Section : English Language and Comprehension

Q.1 Choose the correct one-word substitution for the underlined segment in the given sentence.

The two parties formed a temporary alliance to win the election.

- Ans
- ☒ 1. syndicate
 - ☒ 2. confederation
 - ☒ 3. federation
 - ☒ 4. coalition

Q.2 A sentence is divided into the following four segments. Rearrange them to form a coherent sentence.

- (A) since the encryption protocol underwent continuous revision
(B) vulnerabilities were quickly detected
(C) enabling rapid patch deployment
(D) that preserved system reliability

Ans  1. BCAD
 2. ABCD
 3. ACBD
 4. BACD

Q.3 Rectify the sentence by selecting the correct spelling of the highlighted word from the options provided.

Despite the unforeseen weather, the principal assured us the curriculum would not be postponed.

Ans  1. curriculumn
 2. curriculum
 3. curriculum
 4. curricullum

Q.4 Choose the correct idiom that can replace the underlined segment without changing the meaning of the sentence.

Despite limited resources, the small company handled the crisis with courage and control.

Ans  1. called it a day
 2. threw in the towel
 3. took the bull by the horns
 4. jumped the gun

Q.5 Choose the correct proverb that can replace the underlined segment without changing the meaning of the sentence.

If you want to succeed, you must work hard because nothing can be achieved without effort.

Ans  1. actions speak louder than words
 2. make hay while the sun shines
 3. Rome was not built in a day
 4. practice makes perfect

Q.6 Select the correct option to complete the given sentence.
We must carefully study intricate details of the contract before committing to stipulated terms and conditions.

Ans  1. an, the
 2. an, a
 3. the, the
 4. the, a

Q.7 Choose the correct option to complete the sentence in Direct Speech.

The teacher said, “_____ all your homework before coming to class.”

Ans  1. You finish
 2. He finishes
 3. They finish
 4. We finish

Q.8 Choose the sentence that is correctly written in the Future Perfect Tense.

Ans  1. The committee will have been announcing the results since morning.
 2. The committee will be announcing the results tomorrow.
 3. The committee will have announced the results by tomorrow.
 4. The committee will announce the results tomorrow.

Q.9 Select the word which means the same as the underlined group of words given.
Her leadership style reflected rule by a small, privileged group that strengthened internal control.

- Ans**
- ☒ 1. Oligarchy
 - ☐ 2. Democracy
 - ☐ 3. Kleptocracy
 - ☐ 4. Anarchy

Q.10 Identify the antonym of the underlined word used in the sentence.

The manager appreciated the employee's frank remarks during the meeting.

- Ans**
- ☐ 1. honest
 - ☐ 2. genuine
 - ☐ 3. open
 - ☒ 4. secretive

Q.11 Choose the most appropriate antonym of the highlighted word in the given sentence.
A person who is profligate with their wealth is the opposite of one who is financially parsimonious.

- Ans**
- ☐ 1. Bountiful
 - ☐ 2. Liberal
 - ☐ 3. Extravagant
 - ☒ 4. Thrifty

Q.12 Choose the correct passive form of the given active sentence.

The manager is reviewing the annual report.

- Ans**
- ☐ 1. The annual report has been reviewed by the manager.
 - ☐ 2. The annual report is reviewed by the manager.
 - ☒ 3. The annual report is being reviewed by the manager.
 - ☐ 4. The annual report was reviewed by the manager.

Q.13 Select the correct option to complete the given sentence.
The _____ scent of blooming jasmine filled the evening air, making the garden walk truly enjoyable.

- Ans**
- ☐ 1. elusive
 - ☒ 2. fragrant
 - ☐ 3. pungent
 - ☐ 4. metallic

Q.14 Rearrange the sentence parts to form a meaningful sentence.

- a. the children
- b. in the park
- c. were playing
- d. happily with
- e. their friends

- Ans**
- ☐ 1. beadc
 - ☐ 2. acedb
 - ☐ 3. ebacd
 - ☒ 4. acdeb

Q.15 Choose the correct option to complete the sentence.

Her speech was so _____ that even the critics applauded her sincerity.

- Ans**
- ☐ 1. hesitant
 - ☐ 2. arrogant
 - ☐ 3. indifferent
 - ☒ 4. persuasive

Comprehension:

Read the passage carefully and answer the questions that follow.

Renewable energy has become an essential focus for nations seeking to reduce their reliance on fossil fuels and curb environmental degradation. Among all available sources, solar energy is emerging as the most practical and sustainable option. Governments are investing heavily in solar parks and rooftop systems to cut carbon emissions and secure long-term energy independence. Technological progress has significantly reduced the cost of solar panels, making them affordable for households and industries alike. Despite these advancements, challenges persist. Solar power generation depends heavily on weather and daylight conditions, which vary from region to region. In addition, large-scale solar installations often demand vast land areas, raising concerns about the impact on local ecosystems. Yet, innovations such as high-efficiency storage batteries and floating solar platforms are gradually solving these problems. The adoption of solar energy is not merely an environmental decision but a moral and economic one, ensuring sustainability for future generations. As awareness increases, it becomes evident that ecological preservation and technological advancement can progress together, demonstrating that the global transition to renewable energy is both possible and necessary.

SubQuestion No : 16

Q.16 What major factor has made solar energy more affordable?

- Ans**
- ☒ 1. Growing fossil fuel demand
 - ☒ 2. Rising import taxes
 - ☒ 3. Falling cost of solar panels
 - ☒ 4. Government subsidies

Comprehension:

Read the passage carefully and answer the questions that follow.

Renewable energy has become an essential focus for nations seeking to reduce their reliance on fossil fuels and curb environmental degradation. Among all available sources, solar energy is emerging as the most practical and sustainable option. Governments are investing heavily in solar parks and rooftop systems to cut carbon emissions and secure long-term energy independence. Technological progress has significantly reduced the cost of solar panels, making them affordable for households and industries alike. Despite these advancements, challenges persist. Solar power generation depends heavily on weather and daylight conditions, which vary from region to region. In addition, large-scale solar installations often demand vast land areas, raising concerns about the impact on local ecosystems. Yet, innovations such as high-efficiency storage batteries and floating solar platforms are gradually solving these problems. The adoption of solar energy is not merely an environmental decision but a moral and economic one, ensuring sustainability for future generations. As awareness increases, it becomes evident that ecological preservation and technological advancement can progress together, demonstrating that the global transition to renewable energy is both possible and necessary.

SubQuestion No : 17

Q.17 What can be inferred about the adoption of solar energy?

- Ans**
- ☒ 1. It will remain unchanged
 - ☒ 2. It will expand with innovation
 - ☒ 3. It will decline due to climate change
 - ☒ 4. It will depend solely on government aid

Comprehension:

Read the passage carefully and answer the questions that follow.

Renewable energy has become an essential focus for nations seeking to reduce their reliance on fossil fuels and curb environmental degradation. Among all available sources, solar energy is emerging as the most practical and sustainable option. Governments are investing heavily in solar parks and rooftop systems to cut carbon emissions and secure long-term energy independence. Technological progress has significantly reduced the cost of solar panels, making them affordable for households and industries alike. Despite these advancements, challenges persist. Solar power generation depends heavily on weather and daylight conditions, which vary from region to region. In addition, large-scale solar installations often demand vast land areas, raising concerns about the impact on local ecosystems. Yet, innovations such as high-efficiency storage batteries and floating solar platforms are gradually solving these problems. The adoption of solar energy is not merely an environmental decision but a moral and economic one, ensuring sustainability for future generations. As awareness increases, it becomes evident that ecological preservation and technological advancement can progress together, demonstrating that the global transition to renewable energy is both possible and necessary.

SubQuestion No : 18

Q.18 What is the central idea of the passage?

- Ans**
- ☒ 1. The decline of fossil fuels in global markets
 - ☒ 2. The history of renewable power sources
 - ☒ 3. Solar energy as a sustainable yet challenging solution
 - ☒ 4. The failure of energy reforms

Comprehension:

Read the passage carefully and answer the questions that follow.

Renewable energy has become an essential focus for nations seeking to reduce their reliance on fossil fuels and curb environmental degradation. Among all available sources, solar energy is emerging as the most practical and sustainable option. Governments are investing heavily in solar parks and rooftop systems to cut carbon emissions and secure long-term energy independence. Technological progress has significantly reduced the cost of solar panels, making them affordable for households and industries alike. Despite these advancements, challenges persist. Solar power generation depends heavily on weather and daylight conditions, which vary from region to region. In addition, large-scale solar installations often demand vast land areas, raising concerns about the impact on local ecosystems. Yet, innovations such as high-efficiency storage batteries and floating solar platforms are gradually solving these problems. The adoption of solar energy is not merely an environmental decision but a moral and economic one, ensuring sustainability for future generations. As awareness increases, it becomes evident that ecological preservation and technological advancement can progress together, demonstrating that the global transition to renewable energy is both possible and necessary.

SubQuestion No : 19

Q.19 Which tone best describes the author's attitude?

- Ans**
- ☒ 1. Analytical yet optimistic
 - ☐ 2. Incendiary/ provocative
 - ☐ 3. Critical and Cynical
 - ☐ 4. Jovial and Jocular/Humorous

Comprehension:

Read the passage carefully and answer the questions that follow.

Renewable energy has become an essential focus for nations seeking to reduce their reliance on fossil fuels and curb environmental degradation. Among all available sources, solar energy is emerging as the most practical and sustainable option. Governments are investing heavily in solar parks and rooftop systems to cut carbon emissions and secure long-term energy independence. Technological progress has significantly reduced the cost of solar panels, making them affordable for households and industries alike. Despite these advancements, challenges persist. Solar power generation depends heavily on weather and daylight conditions, which vary from region to region. In addition, large-scale solar installations often demand vast land areas, raising concerns about the impact on local ecosystems. Yet, innovations such as high-efficiency storage batteries and floating solar platforms are gradually solving these problems. The adoption of solar energy is not merely an environmental decision but a moral and economic one, ensuring sustainability for future generations. As awareness increases, it becomes evident that ecological preservation and technological advancement can progress together, demonstrating that the global transition to renewable energy is both possible and necessary.

SubQuestion No : 20

Q.20 Which is the most suitable title?

- Ans**
- ☐ 1. Powering the Past
 - ☐ 2. Fossil Fuels and Economic Crisis
 - ☐ 3. The Cost of Energy Revolution
 - ☒ 4. A Brighter Future: The Promise of Solar Power

Section : Discipline1

Q.1 In dielectric materials, polarization is defined as the:

- Ans**
- ☐ 1. Creation of free electrons in the conduction band.
 - ☐ 2. Flow of current through an insulating material.
 - ☐ 3. Process of applying an external electric field.
 - ☒ 4. Alignment of electric dipoles or creation of dipoles in response to an external electric field.

Q.2 The accuracy of a DAC is measured in _____.

- Ans**
- ☐ 1. Most significant bit (MSB)
 - ☐ 2. Signal-to-noise ratio (SNR)
 - ☐ 3. Least significant bit (LSB)
 - ☒ 4. Percentage of full-scale

Q.3 In C programming, which of the following is a valid variable declaration, according to standard rules?

- Ans**
- ☐ 1. int 1stNumber;
 - ☐ 2. float total-mark;
 - ☒ 3. char my_var;
 - ☐ 4. double return;

Q.4 A key advantage of using an MI instrument for AC measurements is that its range can be easily extended using instrument transformers without needing:

- Ans**
- ☐ 1. A damping vane
 - ☐ 2. A temperature compensation circuit
 - ☐ 3. A magnetic shield
 - ☒ 4. A rectifier circuit

Q.5 Based on the number of operands they require, how would you classify the increment operator (++) and the addition operator (+)?

- Ans**
- ☐ 1. Both are Binary Operators.
 - ☐ 2. ++ is a Binary Operator, and + is a Unary Operator.
 - ☒ 3. ++ is a Unary Operator, and + is a Binary Operator.
 - ☐ 4. Both are Unary Operators.

Q.6 An infrared lamp is designed as a sealed quartz bulb containing an inert gas. The most suitable material for the heating element inside this bulb is:

- Ans**
- ☐ 1. Carbon, due to its high negative temperature coefficient.
 - ☐ 2. Nichrome, due to its perfect oxidation resistance in air.
 - ☐ 3. Copper, due to its excellent conductivity.
 - ☒ 4. Tungsten, due to its exceptionally high melting point.

Q.7 Which of the following describes the relationship between the permittivity of a dielectric material and the electric field applied to it?

- Ans**
- ☐ 1. Permittivity is inversely proportional to the electric field.
 - ☐ 2. Permittivity is directly proportional to the electric field.
 - ☒ 3. Permittivity is the measure of a material's ability to polarise in response to the electric field.
 - ☐ 4. Permittivity is the measure of a material's ability to resist the electric field.

Q.8 In the two-wattmeter method for a balanced three-phase load, if the two readings are equal ($W_1 = W_2$), this indicates that the load power factor is::

- Ans**
- ☐ 1. 0.866 leading
 - ☒ 2. Unity
 - ☐ 3. Zero lagging
 - ☐ 4. 0.5 lagging

Q.9 What is the value of load factor of power generating plant having average load of 20 kW and peak demand of 80 kW?

- Ans**
- ☐ 1. 0.50
 - ☐ 2. 0.15
 - ☒ 3. 0.25
 - ☐ 4. 0.05

Q.10 The most ubiquitous application of glass as a solid insulating material is in:

- Ans**
- ☐ 1. Magnetic tape recording.
 - ☒ 2. Overhead power line insulators.
 - ☐ 3. Transformer cores.
 - ☐ 4. Semiconductor substrates.

Q.11 What is the result of adding the binary numbers 1010 and 1101?

- Ans**
- ☐ 1. 10011
 - ☐ 2. 00111
 - ☐ 3. 10110
 - ☒ 4. 10111

Q.12 Two point charges, $q_1 = +4 \mu\text{C}$ and $q_2 = -5 \mu\text{C}$, are placed 20 cm apart in a vacuum. Calculate the magnitude of the electrostatic force experienced by charge q_1 .

- Ans
- ☒ 1. 4.5 N
 - ☐ 2. 2 N
 - ☐ 3. 9 N
 - ☐ 4. 12 N

Q.13 In the design of a half-subtractor, if we replace the AND gate used for the Borrow output with a NAND gate and appropriately invert one of its inputs, which of the following statements is true about the new Borrow output?

- Ans
- ☐ 1. The circuit will still function correctly as a half-subtractor without additional changes.
 - ☐ 2. The Borrow output will match the standard Borrow if input A is inverted before feeding to this NAND.
 - ☒ 3. The Borrow output will be the logical complement of the standard half-subtractor's Borrow.
 - ☐ 4. It will produce the correct Borrow only if the XOR gate for the Difference is replaced with an XNOR gate.

Q.14 Which function does NOT return a value?

- Ans
- ☐ 1. `int main()`
 - ☐ 2. `char getChar()`
 - ☐ 3. `int add()`
 - ☒ 4. `void display()`

Q.15 To extend the current range of a PMMC instrument to measure higher DC currents, a low resistance is connected in:

- Ans
- ☐ 1. Series with the meter's magnetic core
 - ☐ 2. Series with the power supply
 - ☒ 3. Parallel with the meter
 - ☐ 4. Series with the meter

Q.16 What is the fundamental distinction between an independent source and a dependent source?

- Ans
- ☐ 1. An independent source is linear, while a dependent source is non-linear.
 - ☐ 2. An independent source is always DC, while a dependent source is always AC.
 - ☐ 3. An independent source provides more power.
 - ☒ 4. An independent source establishes a voltage or current regardless of other elements, while a dependent source's value is controlled by another circuit variable.

Q.17 A RAM chip is organized into 8 banks, each containing 1024 rows. If each row contains 1024 columns and each column stores 1 bit, what is the total storage capacity of the chip?

- Ans
- ☒ 1. 1 MB
 - ☐ 2. 16 MB
 - ☐ 3. 8 MB
 - ☐ 4. 4 MB

Q.18 A ceramic capacitor has four color bands: Yellow (1st), Violet (2nd), Black (3rd), and Red (4th). What is its nominal capacitance?

- Ans
- ☒ 1. 47 pF
 - ☐ 2. 4.7 pF
 - ☐ 3. 470 pF
 - ☐ 4. 4700 pF

Q.19 For the pointer of an analog instrument to come to a steady deflection proportional to the measurand, which of the following must be true?

- Ans
- ☐ 1. Deflecting torque = 0
 - ☒ 2. Controlling torque = Deflecting torque
 - ☐ 3. Damping torque = Deflecting torque
 - ☐ 4. Damping torque = Controlling torque

Q.20 Which of the following statements about a do-while loop in C is CORRECT?

- Ans**
- ☐ 1. The condition of a do-while loop is checked before the loop body executes.
 - ☒ 2. A do-while loop guarantees that the loop body executes at least once.
 - ☐ 3. The semicolon after the while(condition) is optional.
 - ☐ 4. A do-while loop may execute zero times if the condition is initially false.

Section : **Discipline2**

Q.1 A plant having maximum capacity of 150 MW operates at 100 MW. What is the value of hot reserve?

- Ans**
- ☒ 1. 50 MW
 - ☐ 2. 125 MW
 - ☐ 3. 100 MW
 - ☐ 4. 75 MW

Q.2 Gate triggering of SCR means:

- Ans**
- ☐ 1. Increasing the anode current
 - ☐ 2. Applying reverse voltage across SCR
 - ☒ 3. Applying a small current (gate) pulse to initiate conduction
 - ☐ 4. Reducing holding current

Q.3 Which of the following is true about a Half-Bridge Series Inverter?

- Ans**
- ☐ 1. It produces a continuous DC output across the load
 - ☐ 2. It cannot be used with a resistive load
 - ☐ 3. It requires a center-tapped transformer in the load circuit
 - ☒ 4. It uses two switching devices and provides an alternating output voltage

Q.4 Photometry is a technique for the measurement of:

- Ans**
- ☐ 1. solid angle
 - ☐ 2. distance from source
 - ☐ 3. glare
 - ☒ 4. candle power

Q.5 What happens to the output voltage when duty cycle $D=0.5$ in a buck-boost converter?

- Ans**
- ☐ 1. Output = 0
 - ☒ 2. Output = $-V_{in}$
 - ☐ 3. Output = $V_{in}/2$
 - ☐ 4. Output = Input

Q.6 Which of the following terms is NOT associated with the formation of arc in a circuit breaker?

- Ans**
- ☐ 1. Zero crossing current
 - ☐ 2. Ionisation
 - ☒ 3. Magnetizing current
 - ☐ 4. Plasma formation

Q.7 According to law of inverse square for illumination on surface of area, A at distance, r from point Source, S of luminuous intensity, I is given as (given Cosθ and Sinθ are Cosine and Sine of angle between normal at that point and direction of luminuous flux, respectively):

- Ans
- ☒ 1. $E = \frac{I}{r^2}$
 - ☒ 2. $E = \frac{\text{Cos}\theta}{r}$
 - ☒ 3. $E = \frac{I^2 \text{Sin}\theta}{r}$
 - ☒ 4. $E = \frac{A}{I.r}$

Q.8 In a shaded-pole AC servomotor, the rotor is of which type?

- Ans
- ☒ 1. Squirrel-cage rotor
 - ☒ 2. Stepper-type rotor
 - ☒ 3. Permanent magnet rotor
 - ☒ 4. Wound rotor

Q.9 A power system protection scheme is designed NOT to interrupt the circuit current _____.

- Ans
- ☒ 1. above the cut-off current
 - ☒ 2. above the rated current
 - ☒ 3. above the short-circuit current
 - ☒ 4. below the rated current

Q.10 Which of the following component of systems is not necessary to be shown in a single line diagram for load flow study?

- Ans
- ☒ 1. Load
 - ☒ 2. Circuit Breaker
 - ☒ 3. Transformer
 - ☒ 4. Generator

Q.11 Power loss in each line conductor of a transmission line is:

- Ans
- ☒ 1. inversely proportional to maximum value of charging current.
 - ☒ 2. directly proportional to square of maximum value of charging current.
 - ☒ 3. directly proportional to charging current.
 - ☒ 4. directly proportional to maximum value of charging current.

Q.12 The smooth torque and high-speed capability of a BLDC motor are due to:

- Ans
- ☒ 1. A large number of windings located on the rotor
 - ☒ 2. Constant mechanical contact through brushes
 - ☒ 3. Electronic commutation and low inertia rotor
 - ☒ 4. High electrical resistance in the armature windings

Q.13 Which of the following is low resistance method of arc-extinguishing in circuit breaker?

- Ans
- ☒ 1. cooling the arc
 - ☒ 2. lengthening the arc
 - ☒ 3. splitting the arc
 - ☒ 4. zero current crossing

Q.14 A household receives a 3-phase nominal supply voltage of 440 V. The Indian Electricity Rules allow a ±5% variation. If at a certain time the measured voltage is 412 V, which of the following is correct?

- Ans
- ☒ 1. The voltage is exactly at the nominal value.
 - ☒ 2. The voltage is below the permissible range.
 - ☒ 3. The voltage is above the permissible range.
 - ☒ 4. The voltage is within the permissible range.

Q.15 Which of the following solar collectors has the highest efficiency?

- Ans**
- ☐ 1. Linear Fresnel
 - ☒ 2. Parabolic trough
 - ☐ 3. Solar power tower
 - ☐ 4. Flat-plate collectors

Q.16 A Single Line Diagram (SLD) in electrical installation is used to show:

- Ans**
- ☒ 1. Schematic representation of the power flow and distribution network
 - ☐ 2. Measurement of line and phase voltages in a circuit
 - ☐ 3. Physical placement of electrical equipment in a building layout
 - ☐ 4. Step-by-step procedure for equipment installation

Q.17 Which of the following key components is NOT used in a thermo-chemical based power plant?

- Ans**
- ☒ 1. neutron moderator
 - ☐ 2. generator
 - ☐ 3. turbine
 - ☐ 4. condenser

Q.18 Which of the following is NOT a direct cause of insulator failure?

- Ans**
- ☐ 1. Flash Over
 - ☐ 2. Porosity of Material
 - ☐ 3. Short Circuit
 - ☒ 4. Reactive Power Rise

Q.19 Which of the following is the most popular and fundamental application of induction heating?

- Ans**
- ☐ 1. Sterilization of Surgical Instruments.
 - ☐ 2. Gluing of wood
 - ☐ 3. Welding
 - ☒ 4. Melting and Refining of Brass.

Q.20 The fundamental characteristics essential for proper servo operation are:

i) Torque proportional to control voltage

ii) Torque direction determined by control voltage polarity

Which of the above statements is/are correct?

- Ans**
- ☐ 1. Only (i)
 - ☐ 2. Neither (i) nor (ii)
 - ☒ 3. Both (i) and (ii)
 - ☐ 4. Only (ii)

Section : **Discipline3**

Q.1 Which of the following can be considered as part of the internal combustion engine?

- Ans**
- ☐ 1. Brakes
 - ☐ 2. Wheel rim
 - ☐ 3. Suspension system
 - ☒ 4. Piston

Q.2 The specific gravity of a substance is 2. What does this indicate?

- Ans**
- ☐ 1. The substance weighs 2 times as much as an equal volume of water.
 - ☒ 2. The density of the substance is 2 times that of water.
 - ☐ 3. The substance has 2 times the volume of an equal mass of water.
 - ☐ 4. The density of the substance is half that of water.

Q.3 Why do large engines commonly use the combination method of governing?

- Ans**
- ☐ 1. Simple mechanism
 - ☒ 2. Better speed control
 - ☐ 3. High noise
 - ☐ 4. Reduced efficiency

Q.4 Specific volume is defined as the:

- Ans**
- ☒ 1. volume per unit mass
 - ☐ 2. area per unit volume
 - ☐ 3. mass per unit volume
 - ☐ 4. volume per unit area

Q.5 Steady state in 2D transient conduction is reached when:

- Ans**
- ☐ 1. Thermal diffusivity becomes zero
 - ☐ 2. Heat flux increases
 - ☒ 3. Temperature stops changing
 - ☐ 4. Boundaries vanish

Q.6 Find the limiting friction acting on a block weighing 100 N when the coefficient of friction is 0.3:

- Ans**
- ☐ 1. 10 N
 - ☒ 2. 30 N
 - ☐ 3. 25 N
 - ☐ 4. 20 N

Q.7 The primary elements of a Rankine cycle include:

- Ans**
- ☒ 1. Pump, boiler, turbine, condenser
 - ☐ 2. Cylinder, piston, spark plug
 - ☐ 3. Compressor, turbine, nozzle
 - ☐ 4. Reactor, cooling tower, fan

Q.8 When a material's absorptivity is 0.2, what is its corresponding emissivity at that wavelength?

- Ans**
- ☐ 1. 0.8
 - ☐ 2. 0.5
 - ☐ 3. 1.0
 - ☒ 4. 0.2

Q.9 The specific weight of a substance is:

- Ans**
- ☐ 1. dependent on the volume
 - ☐ 2. dependent on the mass
 - ☐ 3. always constant
 - ☒ 4. dependent on the acceleration due to gravity

Q.10 If the resistance is halved and the current remains constant, what happens to the heat generation?

- Ans**
- ☒ 1. Heat is halved
 - ☐ 2. Heat is doubled
 - ☐ 3. Heat remains the same
 - ☐ 4. Heat is quadrupled

Q.11 Which of the following types of equations is commonly used to model nonlinear control systems involving spatial and temporal dynamics?

- Ans**
- ☐ 1. Ordinary Differential Equations
 - ☒ 2. Partial Differential Equations
 - ☐ 3. Algebraic Equations
 - ☐ 4. Integral Equations

Q.12 Heat flow in an isotropic conductor is proportional to which physical property?

- Ans**
- ☒ 1. Temperature gradient
 - ☐ 2. Density
 - ☐ 3. Time
 - ☐ 4. Temperature

Q.13 Determine the degree of reaction when the axial velocity of steam is 60 m/s and blade speed is 120 m/s in a reaction turbine.

- Ans**
- ☐ 1. 0.75
 - ☐ 2. 1
 - ☒ 3. 0.25
 - ☐ 4. 0.5

Q.14 For equal external diameters and material, a hollow shaft is:

- Ans**
- ☐ 1. Weaker but heavier
 - ☐ 2. Weaker and lighter
 - ☐ 3. Stronger but heavier
 - ☒ 4. Stronger and lighter than a solid shaft

Q.15 The centroid of a semicircle lies at a distance from the flat edge:

- Ans**
- ☐ 1. $r/4$
 - ☒ 2. $4r/3\pi$
 - ☐ 3. $r/2$
 - ☐ 4. r

Q.16 Which statement best differentiates a compression-ignition (CI) engine from a spark-ignition (SI) engine?

- Ans**
- ☒ 1. CI engine draws only air and SI engine draws premixed charge
 - ☐ 2. CI engine always runs at higher speed than SI engine
 - ☐ 3. CI engine operates on Otto cycle and SI engine on Diesel cycle
 - ☐ 4. Both engines use identical air–fuel mixture preparation methods

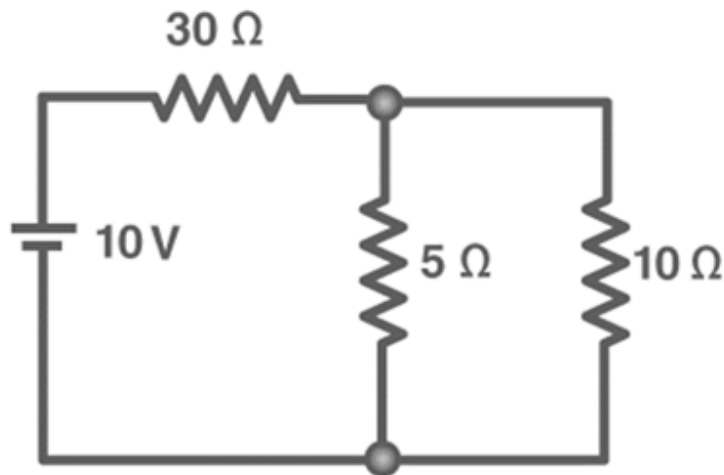
Q.17 What does the Reciprocity Theorem state in the context of electrical networks?

- Ans**
- ☒ 1. The ratio of current in one branch to voltage in another is identical when the source and measurement positions are interchanged.
 - ☐ 2. The total power dissipated in a network equals the algebraic sum of the powers dissipated by all components.
 - ☐ 3. The current through a resistor varies directly with the voltage applied across it in a linear network.
 - ☐ 4. The voltage across a resistor varies directly with the current flowing through it under Ohm's law conditions.

Q.18 Which feature of superheated steam increases its usefulness for operating engines?

- Ans**
- ☐ 1. Higher density
 - ☒ 2. Higher temperature and energy
 - ☐ 3. Higher pressure
 - ☐ 4. Lower boiling point

Q.19 Find the current through a $10\ \Omega$ resistor using Nodal Analysis.



- Ans
- ☐ 1. 200 mA
 - ☐ 2. 50 mA
 - ☒ 3. 100 mA
 - ☐ 4. 10 mA

Q.20 Which of the following is a typical application of an open-loop control system?

- Ans
- ☐ 1. Temperature control in a furnace.
 - ☒ 2. A toaster with a timer.
 - ☐ 3. Speed control of a motor using feedback.
 - ☐ 4. A self-balancing robot.

Section : **Discipline4**

Q.1 Which lubrication method is commonly used for open chain drives?

- Ans
- ☐ 1. Forced feed system
 - ☒ 2. Brush or drip lubrication with oil can
 - ☐ 3. Oil bath
 - ☐ 4. Splash lubrication

Q.2 Which of the following gears is used to transmit power between intersecting shafts?

- Ans
- ☐ 1. Worm gear
 - ☐ 2. Spur gear
 - ☐ 3. Helical gear
 - ☒ 4. Bevel gear

Q.3 In sheet metal bending, the metal is subjected mainly to:

- Ans
- ☒ 1. Tensile stress on the outer surface and compressive stress on the inner surface
 - ☐ 2. Uniform tension throughout thickness
 - ☐ 3. Shear stress only
 - ☐ 4. Pure compressive stress

Q.4 In relation to scales and sheets, the need for dimensioning includes which of the following?

- Ans
- ☐ 1. Using only full-size drawings so dimensioning isn't required
 - ☐ 2. Placing dimensions inside the object outlines irrespective of readability
 - ☒ 3. Ensuring true size is shown despite drawing scale
 - ☐ 4. Omitting dimensioning when drawing is on a small sheet

Q.5 Wahl's factor is used to account for which type of stress in springs?

- Ans**
- ☒ 1. Shear stress due to torsion
 - ☐ 2. Direct compressive stress
 - ☐ 3. Direct tensile stress
 - ☐ 4. Bending stress in coils

Q.6 When a bolt is subjected to combined initial pre-load tension and an external shear load (for example in a flange connection), then for checking failure one often uses:

- Ans**
- ☒ 1. Equivalent (von Mises) stress combining tension & shear
 - ☐ 2. Maximum tensile stress alone
 - ☐ 3. Maximum shear stress alone
 - ☐ 4. Bearing stress under bolt head only

Q.7 Which of the following benefits of using bio-diesel is INCORRECT?

- Ans**
- ☒ 1. Biodiesel is toxic and non-biodegradable.
 - ☐ 2. Reduced wastewater and hazardous waste
 - ☐ 3. Lower air pollution
 - ☐ 4. Reduced greenhouse gas emissions

Q.8 In a centrifugal clutch, engagement of the clutch plates takes place due to:

- Ans**
- ☐ 1. Spring pressure
 - ☒ 2. Centrifugal force
 - ☐ 3. Hydraulic force
 - ☐ 4. Pneumatic pressure

Q.9 Under the Industrial Disputes Act, the process of adjudication for settlement of certain industrial disputes is done by:

- Ans**
- ☐ 1. Works Committee
 - ☐ 2. Board of Conciliation
 - ☐ 3. Mediation by trade union
 - ☒ 4. Labour Court / Industrial Tribunal

Q.10 In the grinding process, metal removal takes place mainly due to:

- Ans**
- ☐ 1. High-temperature fusion
 - ☐ 2. Plastic deformation of surface grains
 - ☐ 3. Chemical reaction between wheel and workpiece
 - ☒ 4. Cutting action of irregularly shaped abrasive grains acting as cutting edges

Q.11 If the wire diameter of a close-coiled helical spring is doubled while keeping all other dimensions same, its deflection under a given load will:

- Ans**
- ☒ 1. Reduce to one-sixteenth
 - ☐ 2. Remain same
 - ☐ 3. Reduce to one-fourth
 - ☐ 4. Become four times

Q.12 The main purpose of king-pin inclination in steering system is to:

- Ans**
- ☒ 1. Bring the wheels automatically to straight-ahead position after a turn
 - ☐ 2. Reduce steering ratio
 - ☐ 3. Increase tyre contact patch
 - ☐ 4. Compensate for caster angle

Q.13 Aluminium is widely used in aircraft and electrical industries primarily because it:

- Ans**
- ☒ 1. Is light, resists corrosion and conducts electricity
 - ☐ 2. Has high strength with limited ductility
 - ☐ 3. Contains alloying elements like carbon and manganese
 - ☐ 4. Possesses high melting point and good hardness

Q.14 Which of the following depreciation methods assumes a uniform loss in value every year?

- Ans
- ☒ 1. Sinking-fund method
 - ☒ 2. Straight-line method
 - ☒ 3. Unit-of-production method
 - ☒ 4. Reducing balance method

Q.15 In cost estimation of metal melting, why is depreciation of the furnace included even though it is not a direct cost?

- Ans
- ☒ 1. Because it reflects gradual wear and tear
 - ☒ 2. Because it reduces fuel consumption
 - ☒ 3. Because it enhances labour productivity
 - ☒ 4. Because it applies only during furnace repairs

Q.16 Which of the following is *not* a primary hardware component required for a CAD workstation?

- Ans
- ☒ 1. Central Processing Unit (CPU)
 - ☒ 2. Graphics Display / Monitor
 - ☒ 3. Audio Sound Card
 - ☒ 4. Plotter or Printer

Q.17 In a sliding mesh gearbox, what is the main method of engaging different gear ratios?

- Ans
- ☒ 1. Gears continuously meshed but selective clutching
 - ☒ 2. Electronic control of gear ratio
 - ☒ 3. Dog clutches only
 - ☒ 4. Sliding gears on splines to mesh with layshaft gears

Q.18 Which modern management control technique explicitly uses Management Information System (MIS) as one of its tools?

- Ans
- ☒ 1. Budget continuation from past year
 - ☒ 2. Personal observation
 - ☒ 3. Break-even analysis
 - ☒ 4. Zero-based budgeting

Q.19 In a flat belt drive, the ratio of tensions on the tight side and slack side depends mainly on which pair of parameters?

- Ans
- ☒ 1. Coefficient of friction and contact angle
 - ☒ 2. Power transmitted and pulley speed
 - ☒ 3. Pulley diameter and belt length
 - ☒ 4. Belt speed and belt width

Q.20 The primary purpose of annealing a steel component is to:

- Ans
- ☒ 1. Improve surface finish
 - ☒ 2. Soften the metal, relieve internal stresses and refine grain structure
 - ☒ 3. Increase hardness and brittleness
 - ☒ 4. Induce compressive stresses on the surface

Section : **Discipline5**

Q.1 In the Hole Basis System, which part has a fixed size, and which part is machined for the required fit?

- Ans
- ☒ 1. Neither hole nor shaft is fixed.
 - ☒ 2. Both hole and shaft are fixed.
 - ☒ 3. The hole is fixed, and the shaft is machined.
 - ☒ 4. The shaft is fixed, and the hole is machined.

Q.2 What is the *Capacity Factor* of a generating unit?

- Ans
- ☐ 1. (Fixed cost) / (Variable cost)
 - ☐ 2. (Available hours) / (Planned maintenance hours)
 - ☒ 3. (Actual energy produced) / (Rated capacity × time)
 - ☐ 4. (Maximum demand) / (Installed capacity)

Q.3 Element X has 18 protons and 22 neutrons. Element Y has 20 protons and 20 neutrons. Which of the following is true about X and Y?

- Ans
- ☐ 1. They are allotropes with the same mass number
 - ☐ 2. They are isotopes because they have the same number of neutrons
 - ☒ 3. They are isobars because their mass numbers are equal
 - ☐ 4. They are the same element with different charges

Q.4 Which of the following best describes a vector?

- Ans
- ☐ 1. A quantity that has only magnitude
 - ☒ 2. A quantity that has both magnitude and direction
 - ☐ 3. A number without units
 - ☐ 4. A quantity that has only direction

Q.5 Which of the following elements has the lowest atomic mass?

- Ans
- ☒ 1. Hydrogen
 - ☐ 2. Carbon
 - ☐ 3. Oxygen
 - ☐ 4. Nitrogen

Q.6 Which of the following sets correctly matches the elements with their respective symbols?

- Ans
- ☒ 1. Sodium – Na, Carbon – C, Phosphorus – P
 - ☐ 2. Chlorine – Cl, Copper – Cu, Nitrogen – Ni
 - ☐ 3. Aluminium – Am, Magnesium – Ma, Sulphur – So
 - ☐ 4. Iron – Fe, Potassium – Po, Calcium – C

Q.7 The relative humidity of the air during sensible cooling:

- Ans
- ☒ 1. Increases
 - ☐ 2. Decreases
 - ☐ 3. Remains constant
 - ☐ 4. Becomes zero

Q.8 What is the main role of control rods in a nuclear reactor?

- Ans
- ☐ 1. To absorb heat from the reactor core and transfer it to the coolant
 - ☐ 2. To increase the speed of neutrons so fission proceeds faster
 - ☐ 3. To separate fuel pellets from coolant
 - ☒ 4. To absorb neutrons and thereby control the rate of fission reactions

Q.9 Which of the following statements is true about the addition of two vectors?

- Ans
- ☐ 1. The sum of two vectors is a scalar
 - ☒ 2. The addition of vectors follows the triangle law
 - ☐ 3. The resultant vector is always equal to the sum of their magnitudes
 - ☐ 4. Vectors can be added only if they act in the same direction

Q.10 A helical compression spring of wire diameter d and mean coil diameter D is loaded by an axial force F . The dominant stress in the spring wire is usually:

- Ans
- ☐ 1. Bending stress
 - ☐ 2. Tensile stress
 - ☐ 3. Compressive stress
 - ☒ 4. Shear (torsional) stress

Q.11 Which of the following is the correct integral of $1/x$ with respect to x ?

- Ans**
- ☐ 1. $ex + C$
 - ☒ 2. $\ln|x| + C$
 - ☐ 3. $x^2 + C$
 - ☐ 4. $1/(2x) + C$

Q.12 Which two additional dimensionless units are defined in the SI system apart from the seven base units?

- Ans**
- ☐ 1. Joule and Newton
 - ☐ 2. Volt and Ampere
 - ☒ 3. Radian and Steradian
 - ☐ 4. Decibel and Minute

Q.13 Which of the following is true for a dopant in a semiconductor?

- Ans**
- ☐ 1. The size of the dopant atoms do not have any role.
 - ☐ 2. The sizes of the dopant atoms should be twice the size of the semiconductor atoms.
 - ☒ 3. The sizes of the dopant and the semiconductor atoms should be comparable.
 - ☐ 4. The sizes of the dopant atoms should be half the size of the semiconductor atoms.

Q.14 If a shaft is specified as $50 \text{ mm} \pm 0.02 \text{ mm}$, what are the upper and lower limits?

- Ans**
- ☒ 1. Upper 50.02 mm, Lower 49.98 mm
 - ☐ 2. Upper 50.20 mm, Lower 49.78 mm
 - ☐ 3. Upper 50.00 mm, Lower 49.00 mm
 - ☐ 4. Upper 50.002 mm, Lower 49.998 mm

Q.15 A nuclear power plant produces electricity by converting energy released from:

- Ans**
- ☒ 1. Nuclear fission in the reactor core
 - ☐ 2. Chemical reactions of coal
 - ☐ 3. Geothermal heat
 - ☐ 4. Photovoltaic effect

Q.16 $\int x \sin x \, dx =$ _____

- Ans**
- ☒ 1. $-x \cos x + \sin x + C$
 - ☐ 2. $x \cos x - \sin x + C$
 - ☐ 3. $x \cos x + \sin x + C$
 - ☐ 4. $\cos x + \sin x + C$

Q.17 The coefficient of performance (COP) of a refrigeration system is defined as the ratio of:

- Ans**
- ☒ 1. Refrigeration effect to work input
 - ☐ 2. Work input to refrigeration effect
 - ☐ 3. Heat rejected to work input
 - ☐ 4. Heat rejected to heat absorbed

Q.18 The cooling coil in an air conditioning system is responsible for:

- Ans**
- ☐ 1. Sensible heating only
 - ☐ 2. Heating and humidification
 - ☐ 3. Heating and de-humidification
 - ☒ 4. Cooling and de-humidification

Q.19 Which of the following best describes the Fundamental Theorem of Calculus?

- Ans**
- ☒ 1. It connects differentiation and integration by stating that integration can be reversed by differentiation.
 - ☐ 2. It provides a method for finding limits of sequences.
 - ☐ 3. It only applies to definite integrals with constant limits.
 - ☐ 4. It is only applicable to discontinuous functions.

Q.20 According to Lenz's law, what is the direction of the induced current when the North-pole of a bar magnet is pushed towards a closed coil?

- Ans**
-  1. Current direction is random
 -  2. Counter-clockwise with respect to the approaching magnet
 -  3. Clockwise with respect to the approaching magnet
 -  4. No current is induced