Junior Engineer Civil Mechanical and Electrical Examination 2023 Paper I

Exam Date	09/10/2023
Exam Time	9:00 AM - 11:00 AM
Subject	Junior Engineer 2023 Civil Paper I

Section : General Intelligence and Reasoning

Q.1 Select the option that is related to the third term in the same way as the second term is related to the first term and the sixth term is related to the fifth term.
9 : 38 :: 13 : ? :: 24 : 83

Ans ✓ 1. 50

✗ 2. 48

✗ 3. 57

✗ 4. 44

Q.2 Which of the following numbers will replace the question marks (?) in the given series?
8, 10, 24, 58, 120, ?

Ans ✓ 1. 218

✗ 2. 234

✗ 3. 243

✗ 4. 216

Q.3 Select the correct option that indicates the arrangement of the following words in a logical and meaningful order.
1. Country
2. Continent
3. City
4. Municipality
5. State

Ans ✓ 1. 2, 1, 5, 3, 4

✗ 2. 1, 2, 5, 3, 4

✗ 3. 5, 3, 2, 4, 1

✗ 4. 1, 2, 5, 4, 3

Q.4 Which letter-cluster will replace the question mark (?) to complete the given series?

XUOA, DYME, JCKI, PGIO, ?

Ans ✗ 1. UKGU

✗ 2. VLGU

✓ 3. VKGU

✗ 4. ULGU

Q.5 Select the option that is related to the fourth term in the same way as the first term is related to the second term and the fifth term is related to the sixth term?

8 : 1 :: ? : 2 :: 200 : 5

Ans ✗ 1. 64

✗ 2. 78

✗ 3. 48

✓ 4. 32

Q.6 In a certain code language, "MERITORIOUS" is written as "10" and "OBJECTIONABLE" is written as "12". How will "PREPATORY" be written in that language?

Ans ✓ 1. 8

✗ 2. 7

✗ 3. 6

✗ 4. 9

Q.7 Two statements are given followed by two conclusions numbered I and II. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the statements.

Statements:

Some plates are cups.

All cups are spoons.

Conclusions:

I. Some spoons are plates.

II. All spoons are plates.

Ans ✔ 1. Only conclusion I follows

✘ 2. Neither conclusion I nor II follows

✘ 3. Only conclusion II follows

✘ 4. Both conclusions I and II follow

Q.8 Select the correct combination of mathematical signs that can sequentially replace the # signs and balance the given equation.
25 # 8 # 21 # 3 # 5 # 4 # 4

Ans ✘ 1. –, +, ×, =, ÷, +

✘ 2. +, –, ÷, ×, =, +

✘ 3. –, +, ÷, ×, =, +

✔ 4. –, +, ÷, =, ×, +

Q.9 Select the option that is related to the fifth term in the same way as the second term is related to the first term and the fourth term is related to the third term.
33 : 627 :: 47 : 893 :: 21 : ?

Ans ✔ 1. 399

✘ 2. 407

✘ 3. 371

✘ 4. 385

Q.10 Select the option that is related to the third word in the same way as the second word is related to the first word. (The words must be considered as meaningful English words and must not be related to each other based on the number of letters/number of consonants/vowels in the word)

Lyric : Song :: Stanza : ?

Ans ✔ 1. Poem

✘ 2. Literature

✘ 3. English

✘ 4. Essay

Q.11 Select the option figure that will replace the question mark (?) in the figure given below to complete the pattern.
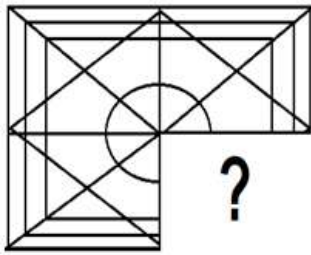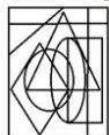

Ans 1. ✔

2. ✘

3. ✘

4. ✘

Q.12 Select the correct combination of mathematical signs to sequentially replace the * signs and balance the given equation.

8 * 2 * 2 * 2 * 2 = 8

Ans ✘ 1. ÷ + − ×

✔ 2. × ÷ + −

✘ 3. × + − ÷

✘ 4. ÷ − + ×

Q.13 Select the option figure which is embedded in the given figure as its part (rotation is NOT allowed).
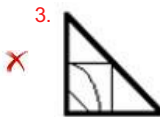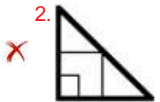

Ans 1. ✘

2. ✘

3. ✔

4. ✘

Q.14 Select the figure from the options that can replace the question mark (?) and complete the given pattern.

Ans
1. ✔

2. ✘

3. ✘

4. ✘

Q.15 Select the word-pair in which the two words are related in the same way as are the two words in the given pair.
(The words must be considered as meaningful English words and must not be related to each other based on the number of letters/number of consonants/vowels in the word.)
Cot : Wood

Ans
✔ 1. Cloth : Cotton

✘ 2. Jewellery : Leg

✘ 3. Utensil : Cook

✘ 4. Stove : Gas

Q.16 Select the option that represents the correct order of the given words as they would appear in an English dictionary.
1. Unaware
2. Unable
3. Unavoidable
4. Unacceptable
5. Unanimous
6. Unaffected

Ans
✘ 1. 4, 2, 6, 5, 3, 1

✔ 2. 2, 4, 6, 5, 3, 1

✘ 3. 2, 4, 6, 5, 1, 3

✘ 4. 2, 4, 5, 6, 3, 1

Q.17 Which letter-cluster will replace the question mark (?) to complete the given series?

MCWF, OFUE, ? , SLQC, UOOB

Ans
✘ 1. PHTC

✘ 2. PITD

✘ 3. OHSE

✔ 4. QISD

Q.18 Select the correct mirror image of the given figure when the mirror is placed at MN as shown below.

M

Lp4f3g7 |

N

Ans ✗ 1. ⌐gƐↃ�ꞁ bq⅃

✓ 2. ⌐gƐↃꞁ bq⅃

✗ 3. ⌐gƐↃꞁ bp⅃

✗ 4. ⌐gƐↃ b q⅃

Q.19 Ram pointed towards a lady and said, "Her daughter is the wife of my son-in-law." What relation does Ram have with the woman he pointed towards?

Ans ✗ 1. Father

✓ 2. Husband

✗ 3. Brother

✗ 4. Sister

Q.20 Which of the following terms will replace the question mark (?) in the given series?
KLJH, FGEC, ABZX, VWUS, ?

Ans ✓ 1. QRPN

✗ 2. PQSM

✗ 3. QRNP

✗ 4. QRTV

Q.21 Vipul departs from his home and walks 20 m towards the east. He then turns left and walks 15 m. He turns left again and walks 10 m. He then takes a right turn and walks 20 m. He then takes a left turn and walks 14 m. He takes a final left turn and walks 45 m to stop at Point X. How far is he from a pole which is 10 m to the south of his house?
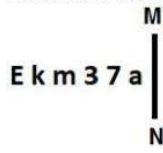(Assume that all the turns are 90° turns only.)

Ans ✗ 1. 10 m

✗ 2. 6 m

✗ 3. 14 m

✓ 4. 4 m

Q.22 Select the correct mirror image of the given combination when the mirror is placed at MN as shown below.

M

1 B 4 E 7 K 8 |

N

Ans ✓ 1. 8 ꓘ Γ Ǝ � 1

✗ 2. 8 ꓘ Γ Ǝ �ᔦ8 1

✗ 3. 8 ꓘ Γ Ǝ �ᔦ8 1

✗ 4. 8 ꓘ Γ Ǝ �ᔦ8 1

Q.23 Select the correct mirror image of the given figure when the mirror is placed at MN as shown below.

M

E k m 3 7 a |

N

Ans

1. ✗ ɘ ⊺ Ɛ ɯ ʞ Ǝ

2. ✓ ɒ ⊺ Ɛ ɯ ʞ Ǝ

3. ✗ ɒ ⊺ Ɛ ɯ ʞ Ǝ

4. ✗ ɒ ⊺ Ɛ ɯ ʞ Ǝ

Q.24 Select the set in which the numbers are related in the same way as are the numbers of the following set.

(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)

(7, 5, 24)

(8, 2, 60)

Ans

✗ 1. (6, 3, 36)

✓ 2. (9, 3, 72)

✗ 3. (6, 3, 18)

✗ 4. (4, 8, 39)

Q.25 Select the option that is related to the third word in the same way as the second word is related to the first word. (The words must be considered as meaningful English words and must not be related to each other based on the number of letters/number of consonants/vowels in the word)
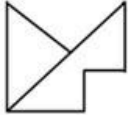
Crew : Sailor :: Army : ?

Ans

✗ 1. War

✗ 2. Battlefield

✗ 3. Police

✓ 4. Soldier

Q.26 Select the number from among the given options that can replace the question mark (?) in the following series.
13, 34, 63, 108, 177, 278, ?

Ans
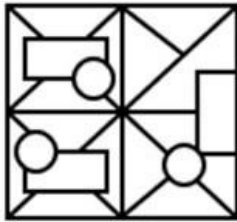
✗ 1. 491

✓ 2. 419

✗ 3. 432

✗ 4. 423

Q.27 Select the option in which the given figure is embedded (rotation is NOT allowed).
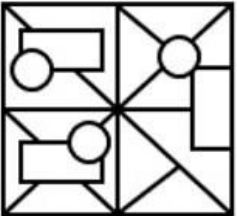

Ans   1.

       2.

       3.
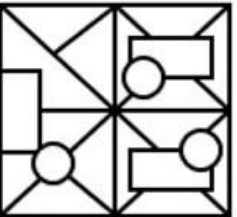
       4.
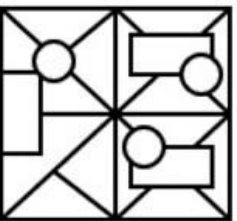
Q.28 Select the option that represents the correct order of the given words as they would appear in an English dictionary.
      1. Adequate
      2. Aphorism
      3. Amplify
      4. Aphrodite
      5. Amorphous
      6. Adamant

Ans   ✗ 1. 6, 1, 3, 5, 2, 4

       ✓ 2. 6, 1, 5, 3, 2, 4

       ✗ 3. 6, 3, 1, 5, 4, 2

       ✗ 4. 6, 1, 3, 2, 5, 4

Q.29 Which letter-cluster will replace the question mark (?) to complete the given series?

      FTFX, GVCT, ?, IZWL, JBTH

Ans   ✗ 1. HSRU

       ✓ 2. HXZP

       ✗ 3. HUTM

       ✗ 4. HEVP

Q.30 Each of the seven friends, Kirti, Siya, Amita, Preeti, Deepika, Jeet and Pari, has scored different marks in an exam. Pari has scored more than Kirti but less than Siya. Deepika has scored less than Preeti but more than Amita. Kirti has scored more than Preeti but less than Pari. Siya is not the highest scorer.

Who among the following has NOT scored more than Preeti?

Ans ✗ 1. Jeet

✗ 2. Siya

✓ 3. Amita

✗ 4. Pari

Q.31 Select the option in which the given figure is embedded (rotation is NOT allowed).

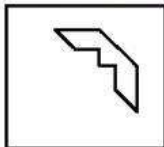
Ans 1.

✗

2.

✓

3.

✗

4.

✗

Q.32 Alisha is an athlete who runs 10 km towards the south and then turns to the left. After running 6 km, she again turns to the left and runs 10 km. Now, In which direction is she from the starting point?

Ans ✗ 1. North

✓ 2. East

✗ 3. South

✗ 4. West

Q.33 If '+' means '−', '−' means '×' , '×' means '÷' , '÷' means '+', what will come in place of the question mark?
153 × 9 - 5 + 32 ÷ 90 = ?

Ans ✗ 1. 155

✗ 2. 150

✓ 3. 143

✗ 4. 160

Q.34 Select the option that is related to the sixth letter-cluster in the same way as the first letter-cluster is related to the second letter-cluster and the third letter-cluster is related to the fourth letter-cluster.

NTD : OVG : : KPM : LRP :: ? : UXQ

Ans
✗ 1. TVM

✗ 2. SVN

✗ 3. SUM

✔ 4. TVN

Q.35 Arrange the following words in a logical and meaningful order.
1. city
2. building
3. state
4. country
5. continent

Ans
✗ 1. 3, 4, 2, 1, 5

✗ 2. 2, 3, 4, 5, 1

✔ 3. 2, 1, 3, 4, 5

✗ 4. 2, 1, 4, 3, 5

Q.36 Select the option that is related to the third word in the same way as the second word is related to the first word (The words must be considered as meaningful English words and must not be related to each other based on the number of letters/consonants/vowels in the word).
Bird : Ornithology :: Plant : _____

Ans
✗ 1. Chemistry

✔ 2. Botany

✗ 3. Physics

✗ 4. Trees

Q.37 Three statements are given followed by three conclusions numbered I, II and III. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the statements.

Statements:
Some chips are wafers.
No wafer is a toffee.
All desserts are chips.

Conclusions:
I. All chips can never be toffees.
II. No dessert is a wafer.
III. Some toffees are desserts.

Ans
✔ 1. Only I follows

✗ 2. None follows

✗ 3. Only I and II follow

✗ 4. Only III follows

Q.38 Select the option that is related to the fifth letter cluster in the same way as the second letter cluster is related to the first letter cluster and the fourth letter cluster is related to the third letter cluster.
JSGXK : ADXIB :: LFCWE : CQTHV :: BDXOF : ?

Ans
✗ 1. ZOOWX

✔ 2. SOOZW

✗ 3. SOXWZ

✗ 4. WXOZD

Q.39 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 its constituent digits. E.g., 13 – Operations on 13 such as adding/subtraction/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)

(6, 12, 9)

(16, 10, 13)

Ans ✘ 1. (3, 14, 8)

✘ 2. (19, 24, 5)

✔ 3. (15, 7, 11)

✘ 4. (13, 38, 4)

Q.40 Seven people, A, B, C, D, E, F and G, are sitting in a straight row, facing north. Only 1 person sits to the left of D. A is an immediate neighbour of D. Only 2 people sit between F and D. Only 3 people sit between C and G. B is not an immediate neighbour of G. Only 2 people sit between E and A.

Who sits to the immediate left of G?

Ans ✘ 1. A

✘ 2. F

✘ 3. E

✔ 4. D

Q.41 Which letter-cluster will replace the question mark (?) to complete the given series?

FDQE, KJXM, PPEU, ?, ZBSK

Ans ✘ 1. VULB

✔ 2. UVLC

✘ 3. VUKB

✘ 4. VULC

Q.42 In a certain code language, 'CHECK' is written as '110' and 'CORRECT' is written as '114'. How will 'WRONG' be written in that language?

Ans ✘ 1. 106

✘ 2. 95

✘ 3. 69

✔ 4. 63

Q.43 K @ L means 'L is the husband of K'
K & L means 'K is the mother of L'
K # L means 'K is the son of L'
If A & B @ C # D @ E, the how is B related to D?

Ans ✔ 1. Son's wife

✘ 2. Sister

✘ 3. Mother

✘ 4. Daughter

Q.44 Which of the following numbers will replace the question mark (?) in the given series?
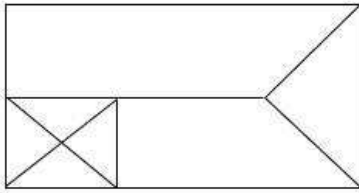
17, 57, 22, 52, ?, 47

Ans ✘ 1. 51

✘ 2. 23

✔ 3. 27

✘ 4. 49

Q.45 In a certain code language, 'LESSON' is written as 'IDPPNK' and 'CLASS' is written as 'ZIZPP'. How will 'CHAPTER' be written in that language?

Ans ✔ 1. ZEZMQDO

✘ 2. MZQEDZO

✘ 3. MDZZOQE

✘ 4. DOZEZMQ

Q.46 How many triangles are there in the given figure?

Ans ✔ 1. 9

    ✘ 2. 7

    ✘ 3. 5

    ✘ 4. 8

Q.47 If '+' means '−', '−' means '×', '×' means '÷', '÷' means '+', then what will come in place of the question mark (?) in the following equation?
13 − 145 × 29 ÷ 52 + 11 = ?

Ans ✘ 1. 94

    ✔ 2. 106

    ✘ 3. 117

    ✘ 4. 83

Q.48 Seven people L, M, N, O, P, Q and R are sitting in a straight line adjacent to one another, facing the north (not necessarily in the given order).
P is sitting third to the left of Q. N is an immediate neighbour of O and Q. L is sitting third to the right of Q. R is the immediate neighbour of L and M.
Who is sitting to the immediate right of P?

Ans ✘ 1. R

    ✘ 2. N

    ✘ 3. Q

    ✔ 4. O

Q.49 In a code language, 'COURT' is written as TROOC and 'SPORT' is written as TRIPS. How will 'BLIND' be written in the same language?

Ans ✘ 1. DNALB

    ✔ 2. DNELB

    ✘ 3. BNELD

    ✘ 4. DNILB

Q.50 A paper is folded and cut as shown below. How will it appear when unfolded?
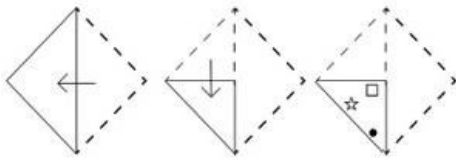
Ans 1.

❌
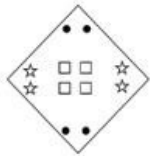
2.

❌
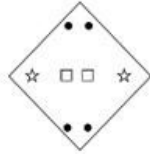
3.

✅
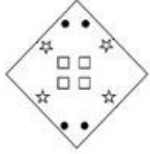
4.

❌
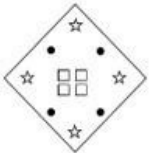
Section : **General Awareness**

Q.1 What is the architectural style of the Brihadisvara temple in Tamil Nadu?

Ans ❌ 1. Gadaga

❌ 2. Champa

❌ 3. Nagara

✅ 4. Dravidian

Q.2 The term 'kick off' is related to which of the following games?

Ans ✅ 1. Football

❌ 2. Cricket

❌ 3. Hockey

❌ 4. Badminton

Q.3 Which city is known as 'Silicon Plateau'?

Ans ❌ 1. Chandigarh

✅ 2. Bengaluru

❌ 3. Ahmedabad

❌ 4. Hyderabad

Q.4 'The Trophic-Dynamic Aspect of Ecology' was studied by whom in the year 1942?

Ans ❌ 1. Alexander Humboldt

❌ 2. Rachel Carson

✅ 3. Raymond L Lindeman

❌ 4. Frederic Clements

Q.5 The Plan for Partition of India is known as the:

Ans ❌ 1. 15th Aug Plan

❌ 2. 5th May Plan

✅ 3. 3rd June Plan

❌ 4. 18th July Plan

Q.6 Name the programme launched by the Ministry of Health and Family Welfare to empower all healthcare workers engaged in oxygen management and administration with the essential knowledge and skills.

Ans ✗ 1. National Oxygen Supervision Programme

✗ 2. National Oxygen Development Programme

✓ 3. National Oxygen Stewardship Programme

✗ 4. National Oxygen Management Programme

Q.7 Which of the following is the most common omega-3 fatty acid found in vegetable oils, nuts (especially walnuts), flaxseed and leafy vegetables that help prevent heart disease and stroke?

Ans ✗ 1. Arachidonic acid (ARA)

✗ 2. Eicosapentaenoic acid (EPA)

✗ 3. Docosahexaenoic acid (DHA)

✓ 4. Alpha-linolenic acid (ALA)

Q.8 The Sangeet Natak Akademi of India recognises 8 dance forms of Indian classical dance. Which of the following is NOT included?

Ans ✗ 1. Bharatanatyam

✓ 2. Chhau

✗ 3. Kuchipudi

✗ 4. Sattriya

Q.9 What is the dimension of a basketball court?

Ans ✗ 1. 28 × 22 m

✗ 2. 28 × 18 m

✗ 3. 28 × 20 m

✓ 4. 28 × 15 m

Q.10 What is in situ conservation method of biodiversity?

Ans ✗ 1. It concerns with the conservation of species in botanic gardens and captive breeding programmes.

✓ 2. It concerns with the conservation areas as 'warehouses' of biological information.

✗ 3. It concerns with the cryopreservation of gametes.

✗ 4. It concerns with the protective maintenance of threatened species in zoological parks.

Q.11 What is the correct sequence of the following ports of India from North to South?
A. Kochi port
B. Mormugao port
C. Kandla port
D. Mumbai port

Ans ✓ 1. C, D, B, A

✗ 2. A, B, C, D

✗ 3. B, A, D, C

✗ 4. A, D, B, C

Q.12 Which of the following Legislative Bills proposed to set-up the Indian Antarctic Authority (IAA) under the Ministry of Earth Sciences, Government of India?

Ans ✗ 1. The Indian Antarctic (Amendment) Bill, 2022

✓ 2. The Indian Antarctic Bill, 2022

✗ 3. The Indian Antarctic (Amendment) Bill, 2021

✗ 4. The Indian Antarctic Bill, 2021

Q.13 The weight loss and marked depletion of subcutaneous fat and muscle mass are characteristic features of which syndrome occurs in infants?

Ans ✓ 1. Marasmus

✗ 2. Eczema

✗ 3. Pertussis

✗ 4. Down syndrome

Q.14 Which of the following is NOT correct regarding the periodic table?

Ans ✔ 1. There are 18 periods and 7 groups in the periodic table.

✘ 2. Group 2 elements are called alkaline earth metals.

✘ 3. Noble gases are included in group 18.

✘ 4. There are 7 periods and 18 groups in the periodic table.

Q.15 Tabla maestro Ustad Alla Rakha was a musician trained by Mian Kader Baksh of the _____.

Ans ✔ 1. Punjab gharana

✘ 2. Farrukhabad gharana

✘ 3. Lucknow gharana

✘ 4. Delhi gharana

Q.16 Who was the captain of India's Under-19 Women's cricket team that won the inaugural edition of the Women's Under-19 T-20 World Cup in January 2023?

Ans ✔ 1. Shafali Verma

✘ 2. Richa Ghosh

✘ 3. Archana Devi

✘ 4. Sweta Sherawat

Q.17 The total members who participate in the election of president is called _____.

Ans ✘ 1. Elite Election Group

✘ 2. First Voters Group

✘ 3. President College

✔ 4. Electoral College

Q.18 According to the Indian Constitution, which of the following is NOT a fundamental duty?

Ans ✘ 1. To abide by the Constitution and respect its ideals

✘ 2. To promote the spirit of brotherhood

✔ 3. To vote in public election

✘ 4. To safeguard public property

Q.19 In which of the following years was the 'New Economic Policy' introduced in India?

Ans ✘ 1. 1993

✘ 2. 1992

✔ 3. 1991

✘ 4. 1990

Q.20 A Parliamentary delegation from _____, led by HE Wangchuk Namgyel, called on the President of India Droupadi Murmu at Rashtrapati Bhavan on 7th February 2023.

Ans ✘ 1. Nepal

✘ 2. Myanmar

✔ 3. Bhutan

✘ 4. Turkey

Q.21 What is the term for the unwanted and unsolicited messages that are sent over the internet?

Ans ✘ 1. Malware

✔ 2. Spam

✘ 3. Phishing

✘ 4. Hacking

Q.22 Which of the following programmes was initiated in 1979 with the objective of upgrading the traditional skills of rural youth belonging to families living below the poverty line, with family income below ₹3,500 per year?

Ans ✘ 1. Rural-Landless Employment Guarantee Programme (RLEGP)

✔ 2. Training to Rural Youth for Self Employment (TRYSEM)

✘ 3. Jawahar Rozgar Yojana (JRY)

✘ 4. National Rural Employment Programme (NREP)

Q.23 Who was responsible for killing the last Mauryan King?

Ans ✗ 1. Simuka

✗ 2. Vasudev Kanva

✓ 3. Pushyamitra Sunga

✗ 4. Kanishka

Q.24 Which of the following article of the Constitution lays down that the National Flag and National Anthem must be respected?

Ans ✗ 1. Art 51A (b)

✗ 2. Art 51A (d)

✗ 3. Art 51A (c)

✓ 4. Art 51A (a)

Q.25 The geothermal gradient is defined as the increase in temperature with depth in the earth. Accordingly, in normal continental crust, the rate of temperature rise within the first 3 to 5 kilometres of the Earth's surface is approximately _____ .

Ans ✗ 1. 70 °C/km

✓ 2. 25 °C/km

✗ 3. 40 °C/km

✗ 4. 10 °C/km

Q.26 How much energy is released from 1 gm of fat?

Ans ✗ 1. 4 calories

✗ 2. 4.2 calories

✓ 3. 9 calories

✗ 4. 5 calories

Q.27 Match the hills of India with their regions.

Hills	Regions
1. Javadi Hills	a. Eastern Ghats
2. Doddabetta	b. Western Ghats
3. Jaintia Hills	c. Purvanchal
4. Patkai Hills	d. Meghalaya Plateau

Ans ✓ 1. 1-a, 2-b, 3-d, 4-c

✗ 2. 1-b, 2-a, 3-d, 4-c

✗ 3. 1-a, 2-d, 3-b, 4-c

✗ 4. 1-a, 2-b, 3-c, 4-d

Q.28 What is the horizontal field view of one eye in human beings?

Ans ✓ 1. 150°

✗ 2. 170°

✗ 3. 50°

✗ 4. 90°

Q.29 Article 19 of the Constitution of India had originally guaranteed _____ rights.

Ans ✗ 1. eight

✗ 2. six

✗ 3. five

✓ 4. seven

Q.30 The headquarters of the Ghadar Party was located at which place?

Ans ✓ 1. San Francisco

✗ 2. New York

✗ 3. Chicago

✗ 4. Washington

Q.31 Which of the following is the correct match of the column-A with column-B?

Column-A (River)	Column-B (Place of Origin)
i. Ganga	a. Amarkantak
ii. Chenab	b. Western Ghats near Mahabaleshwar
iii. Narmada	c. Gangotri glacier
iv. Krishna	d. Spiti

Ans ✗ 1. i-c, ii-a, iii-b, iv-d

✗ 2. i-c, ii-d, iii-b, iv-a

✗ 3. i-d, ii-c, iii-b, iv-a

✓ 4. i-c, ii-d, iii-a, iv-b

Q.32 'Pashto' language is spoken in which of the following neighbouring countries of India?

Ans ✗ 1. China and Myanmar

✓ 2. Afghanistan and Pakistan

✗ 3. Sri Lanka and Maldives

✗ 4. Nepal and Bhutan

Q.33 Select the correct combination of Indian classical dance and their respective dancer.

Ans ✗ 1. Surendra Nath Jena – Kuchipudi

✗ 2. Pandit Birju Maharaj – Sattriya

✗ 3. Guru Bipin Singh – Mohiniyattam

✓ 4. Elam Endira Devi – Manipuri

Q.34 Which of the following is the correct match of the column-A column-B?

Column-A (Type of Rock) Column-B (Example)
i. Sedimentary rocks a. Granite
ii. Igneous rocks b. Limestone
iii. Metamorphic rocks c. Gneiss

Ans ✗ 1. i-a, ii-c, iii-b

✗ 2. i-c, ii-b, iii-a

✓ 3. i-b, ii-a, iii-c

✗ 4. i-c, ii-a, iii-b

Q.35 Apart from income tax, there will also be TDS at _____ and gift tax on digital assets to be paid by the receiver, depending on certain conditions.

Ans ✗ 1. 4%

✗ 2. 5%

✓ 3. 1%

✗ 4. 2%

Q.36 The question consists of two statements, namely, Assertion (A) and Reason (R). Use them to choose the correct alternative.
Assertion (A): Pocket money given by parents is included while estimating national income
Reason (R): It represents a transfer of payment from parents to children

Ans ✓ 1. A is false but R is true

✗ 2. A is true and R is false

✗ 3. Both A and R are true, but R is not the correct explanation of A

✗ 4. Both A and R are true, and R is the correct explanation of A

Q.37 Which of the following is a collection of authoritative terminology originally compiled from IUPAC recommendations published by the scientific divisions of the union?

Ans ✗ 1. Purple Book

✗ 2. Red Book

✓ 3. Gold Book

✗ 4. Orange Book

Q.38 According to the Multidimensional Poverty Index 2022, which was the poorest state?

Ans ✓ 1. Bihar

✗ 2. Assam

✗ 3. West Bengal

✗ 4. Uttar Pradesh

Q.39 Khagen Mahanta was a notable person in the folk music of _____.

Ans ✓ 1. Assam

✗ 2. Andhra Pradesh

✗ 3. Uttar Pradesh

✗ 4. Odisha

Q.40 Which of the following is an inanimate object that forms the environment?

Ans ✗ 1. Fungi

✓ 2. Water

✗ 3. Plants

✗ 4. Fish

Q.41 According to the Indian Bureau of mines 2020, which two states of India have the maximum gold ore reserves?

Ans ✓ 1. Bihar and Rajasthan

✗ 2. Madhya Pradesh and Andhra Pradesh

✗ 3. Karnataka and Uttar Pradesh

✗ 4. Andhra Pradesh and Maharashtra

Q.42 How do colours contribute to effective presentation and documents in MS PowerPoint?

Ans ✗ 1. Colours make the content appear larger and more prominent.

✗ 2. Colours help in copying and pasting content between documents

✗ 3. Automatically correct spelling and grammar errors in the text.

✓ 4. Colours create a sense of hierarchy and emphasise important information.

Q.43 Which of the following is referred to as 'credit money'?

Ans ✗ 1. Money value < Commodity value

✗ 2. Money value = 10 percent less than Commodity value

✗ 3. Money value = Commodity value

✓ 4. Money value > Commodity value

Q.44 Appointment, posting and promotion of District Judge in a state are made by _____.

Ans ✗ 1. Chief justice of the high court of the state in consultation with the governor

✗ 2. President in consultation with the High Court

✗ 3. Chief Minister in consultation with Chief justice of High Court

✓ 4. Governor in consultation with the high court

Q.45 Which parameter is kept constant in Boyle's Law?

Ans ✗ 1. Pressure and mass

✗ 2. Mass

✗ 3. Temperature and pressure

✓ 4. Temperature

Q.46 The book 'Mitakshara' is related to which of the following fields?

Ans ✗ 1. Politics

✗ 2. Agriculture

✗ 3. Finance

✓ 4. Judiciary

Q.47 According to Census of India 2011, what was the sex ratio of Tamil Nadu?

Ans ✗ 1. 991

✗ 2. 993

✓ 3. 996

✗ 4. 931

Q.48 In September 2022, who among the following was honoured with the Dadasaheb Phalke Award for the year 2020?

Ans ✗ 1. Vinod Khanna

✗ 2. Amitabh Bachchan

✗ 3. Rajinikanth

✓ 4. Asha Parekh

Q.49 Whose invasion of India resulted in the third battle of Panipat?

Ans ✗ 1. Babur

✓ 2. Ahmad Shah Abdali

✗ 3. Nadir Shah

✗ 4. Dost Mohammad

Q.50 Match the column-A with column-B.

Column-A (Rock)   Column-B (Structure type)
i. Sedimentary rocks   a. Stratification and lamination
ii. Igneous rocks   b. crystalline structure
iii. Metamorphic rocks c. Foliation

Ans ✓ 1. i-a, ii-b, iii-c

✗ 2. i-b, ii-a, iii-c

✗ 3. i-c, ii-b, iii-a

✗ 4. i-a, ii-c, iii-b

Section : General Engineering Civil and Structural

Q.1

Consider the following methods used to establish a point in the field. (Refer to the figure below.)
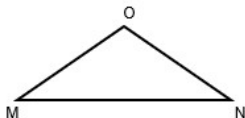
Method 1: Point O is plotted by measuring only the distances MO and NO.

Method 2: Point O is plotted by measuring only the angles NMO and MNO.

Which of these methods also represents the principle of trigonometrical levelling?

Ans ✗ 1. Method 1 only

✓ 2. Method 2 only

✗ 3. Both Method 1 and Method 2

✗ 4. Neither Method 1 nor Method 2

Q.2 A cantilever beam is subjected to two point loads as shown in the given diagram. Find the shear force and bending moment acting at the support of the beam.

Ans
❌ 1. SF = 10 kN, BM = 80 kN-m

✅ 2. SF = 50000 N, BM = 80 kN-m

❌ 3. SF = 50 kN, BM = 50 kN-m

❌ 4. SF = 50 kN, BM = 8000 N-m

Q.3 With reference to compression members of steel structures, the slenderness ratio of compression is defined as the _____.

Ans
❌ 1. ratio of the effective length to the actual length of the member
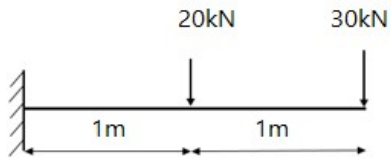
❌ 2. ratio of the length of the member to the appropriate radius of gyration

✅ 3. ratio of the effective length of the member to the appropriate radius of gyration

❌ 4. ratio of the effective length to the area of section of the member

Q.4 A 3-degrees curve is situated on a ruling gradient of 1 in 250 on a broad Gauge track. What should be the actual ruling gradient considering the grade compensation of curvature?

Ans
✅ 1. 0.28%

❌ 2. 0.12%

❌ 3. 1 in 280

❌ 4. 1 in 300

Q.5 The number of vibrations of a sound wave per unit time is measured in _____.

Ans
❌ 1. pressure second

❌ 2. bel

✅ 3. hertz

❌ 4. decibel

Q.6 The length of the first sub chord is 10 m and the radius of the curve is 200 m. Find the first tangential angle for setting out a circular curve.

Ans
❌ 1. 100 '

❌ 2. 100°

❌ 3. 85.95°

✅ 4. 85.95 '

Q.7 With increase in the input power of pump, the efficiency of pump _____.

Ans
❌ 1. increases

❌ 2. remains the same

✅ 3. decreases

❌ 4. It is independent of the power

Q.8 Consider the following statements in a situation where cement and steel are supplied by the department.
I: 10% profit should be added on the cost of cement and steel.
II: Cost of carriage from godown to site work should be added.
Which of the following options is true?

Ans
❌ 1. Both statements I and II are false

❌ 2. Only statement I is true

✅ 3. Only statement II is true

❌ 4. Both statements I and II are true

Q.9 A map of a certain area is drawn on a sheet. The distance on the map is 1 dm and that on the ground is 5 km. The representative fraction for the given data is _____.
(Note that 'dm' means decimetre.)

Ans ✗ 1. $\dfrac{1}{5000}$

✗ 2. $\dfrac{1}{500}$

✗ 3. $\dfrac{1}{500000}$

✔ 4. $\dfrac{1}{50000}$

Q.10 According to IS 800:2007, steel purlins are primarily designed as _____

Ans ✗ 1. compression members

✔ 2. flexural members

✗ 3. tension members

✗ 4. torsional members

Q.11 The distance between two points measured during a hot summer by using a 30 m long chain was 2.4 km. At the end of the day's work, it was found that the chain was 2 decimetre longer. Which of the following is the correct option?

Ans ✗ 1. The measured distance is 16 m more than the actual distance.

✗ 2. The measured distance is 1.6 cm more than the actual distance.

✔ 3. The measured distance is 1600 cm less than the actual distance.

✗ 4. The measured distance is 16 cm less than the actual distance.

Q.12 Which of the following statements is correct with respect to compaction and consolidation?

Ans ✗ 1. Compaction is valid for cohesive soils, whereas consolidation is applicable for all types of soils.

✗ 2. Both compaction and consolidation degrade the engineering properties of soil.

✔ 3. Both compaction and consolidation improve the engineering properties of soil.

✗ 4. Compaction releases pore water, whereas consolidation releases pore air.

Q.13 The coefficient of passive pressure K_p is _____ if the coefficient of active pressure K_a is 1/4.

Ans ✗ 1. 0.5

✗ 2. 0.25

✔ 3. 4

✗ 4. 0.33

Q.14 The scrap value of a building is considered _____ of the cost of construction.

Ans ✗ 1. 2%

✗ 2. 15%

✗ 3. 5%

✔ 4. 10%

Q.15 The A-line in the unified classification system table is used to determine the plasticity index (I_P) of soil sample on its liquid limit (W_L). The equation for the A-line is given as _____.

Ans ✗ 1. $I_P = 0.5 (20 - W_L)$

✔ 2. $I_P = 0.73 (W_L - 20)$

✗ 3. $I_P = W_L - 40$

✗ 4. $I_P = 0.73 (40 - W_L)$

Q.16 Read the given statements about crop water requirement and select the correct option.
Statement 1: Duty will be less for a crop requiring more water.
Statement 2: The water lost due to percolation will be more and hence the duty will be more.

Ans ✓ 1. Statement 1 is true and statement 2 is false

✗ 2. Both statement 1 and statement 2 are false

✗ 3. Both statement 1 and statement 2 are true

✗ 4. Statement 1 is false and statement 2 is true

Q.17 A cantilever beam is loaded as per the given diagram. Find the bending moment acting at the mid span of beam.
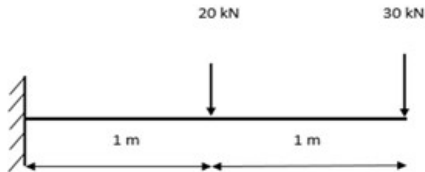
Ans ✗ 1. 5000 N-m

✗ 2. 50 kN-m

✗ 3. 3000 N-m

✓ 4. 30 kN-m

Q.18 As per IS 11624-1986, what will be the water quality rating of irrigation water when electrical conductivity (EC) is in the range of 1500 to 3000 (micromhos/cm)?

Ans ✗ 1. Very high

✗ 2. High

✗ 3. Low

✓ 4. Medium

Q.19 In the centesimal system of angular measurement, 1 Circumference = _____

Ans ✗ 1. 180 grads

✗ 2. 360 grads

✗ 3. 100 grads

✓ 4. 400 grads

Q.20 Superplasticisers are also called _____.

Ans ✓ 1. high-range water reducers

✗ 2. retardants

✗ 3. accelerators

✗ 4. low-range water reducers

Q.21 Which of the following statements with respect to characteristics of solid waste is correct?

Ans ✓ 1. The refuse of a typical Indian city has more garbage percentage (by weight) than that of a city in the USA

✗ 2. The refuse of a typical Indian city has more rubbish percentage (by weight) than that of a city in the USA

✗ 3. The refuse of a typical Indian city has less garbage percentage (by weight) than that of a city in the USA

✗ 4. The refuse of a typical Indian city has less density than that of a city in the USA

Q.22 Which of the following is an acoustical property of the construction material?

Ans ✓ 1. Transmission

✗ 2. Hygroscopicity

✗ 3. Creep

✗ 4. Thermal resistivity

Q.23 Which of the following is NOT a structural stability criterion of a gravity dam?

Ans ✗ 1. Overturning

✗ 2. Sliding

✗ 3. Crushing

✓ 4. Overspill

Q.24 Which of the following is NOT the requirement of an ideal permanent way?

Ans ✗ 1. There must be certain amount of elasticity in the track.

✗ 2. The drainage system must be perfect.

✓ 3. It should always be straight.

✗ 4. There must be provisions of easy renewals.

Q.25 In a compaction test, the dry unit weight stops increasing after optimum moisture content because:

Ans ✗ 1. of bulking of soil

✗ 2. of capillary action

✗ 3. the electrical double layer stops expanding

✓ 4. water particles start occupying space of soil grains

Q.26 Which of the following is NOT employed in the secondary treatment of sewage?

Ans ✗ 1. Contact beds

✓ 2. Skimming tanks

✗ 3. Trickling filters

✗ 4. Sand filters

Q.27 Under which of the following conditions will a steel column fail in buckling?

Ans ✗ 1. A steel column cannot fail in buckling.

✗ 2. less than 180

✓ 3. greater than 180

✗ 4. The column is short.

Q.28 Which of the following is NOT a field of application of sulphate-resisting cement?

Ans ✓ 1. Dams

✗ 2. Marine structures

✗ 3. Foundation and basement

✗ 4. Sewage treatment works

Q.29 In traffic control, the conflict points are reduced to bare minimum and the delays are minimised by designing:

Ans ✗ 1. horizontal curve

✓ 2. road intersection

✗ 3. bridges

✗ 4. super-passage

Q.30 Surfaces painted by _____ shine like radium dials after the source of light has been cut off.

Ans ✓ 1. enamel paint

✗ 2. emulsion paint

✗ 3. plastic paint

✗ 4. oil paint

Q.31 To study the wind pressure effect on a hollow circular chimney, the projected area calculation is given as:

Ans ✗ 1. $(\text{Height of chimney}) \times (\text{Mean diameter of chimney shaft})$

✗ 2. $(\text{Height of chimney}) \times (\text{Internal diameter of chimney shaft})$

✗ 3. $(\frac{1}{2}) \times (\text{Height of chimney}) \times (\text{Internal diameter of chimney shaft})$

✓ 4. $(\text{Height of chimney}) \times (\text{External diameter of chimney shaft})$

Q.32 What is the minimum value of effective depth of a cantilever RCC beam of span 7 m to satisfy the vertical deflection limit as per IS 456-2000?

Ans ✗ 1. 500 mm

✓ 2. 1000 mm

✗ 3. 269.2 mm

✗ 4. 350 mm

Q.33 If the section factor and the hydraulic depth for a rectangular channel are 40 m and 4 m, respectively, then calculate the top width of the channel.

Ans ✗ 1. 4 m

✗ 2. 3 m

✓ 3. 5 m

✗ 4. 6 m

Q.34 A fine grained soil has liquid limit of 55 and plastic limit of 20 as per plasticity chart. According to IS classification, the soil is represented by which of the following letter symbols?

Ans ✓ 1. CH

✗ 2. CL-ML

✗ 3. CL-OL

✗ 4. CI-ML

Q.35 The type of timber recommended for constructional purpose, whose modulus of elasticity in bending is above 12.5 kN/mm^2, is classified as _____ timber.

Ans ✓ 1. Group A

✗ 2. Group B

✗ 3. Group C

✗ 4. Group D

Q.36 The repair works that are usually carried out every fourth year are known as _____.

Ans ✗ 1. annual repair works

✗ 2. biennial repair works

✓ 3. quadrennial repair works

✗ 4. regular repair works

Q.37 The total area enclosed by an irrigation canal that can be included in an irrigation project for supplying water to agricultural land by a network of canals is known as _____.

Ans ✗ 1. unculturable area

✗ 2. culturable cultivable area

✓ 3. gross command area

✗ 4. culturable command area

Q.38 Which of the following is obtained by rotating a log of wood against a sharp knife of rotary cutter?

Ans ✓ 1. Veneers

✗ 2. Plywood

✗ 3. Batten board

✗ 4. Laminboard

Q.39 A pump has to pump water through a pipeline of height of 10 m above the ground at a rate of 0.2 m^3/sec. The water in a sump tank is 5 m below the ground level. Neglect head loss due to friction, the pumping power required would be _____ (Consider g = 10 m/s^2).

Ans ✓ 1. 30 KW

✗ 2. 22 KW

✗ 3. 25 KW

✗ 4. 33 KW

Q.40 Which method involves driving piles along both sides of an existing wall and inserting a needle in the form of pile caps through the existing one?

Ans ✗ 1. Miscellaneous method

✗ 2. Pit method

✗ 3. Vibro-flotation

✓ 4. Pile method

Q.41 The standard consistency test of cement is conducted by using _____.

Ans ✗ 1. Blaine's permeability apparatus

✗ 2. Casagrande's apparatus

✓ 3. Vicat's apparatus

✗ 4. Le Chatelier's apparatus

Q.42 A manometer is an instrument used for measuring the pressure acting on a column of fluid, which consists of a U-shaped tube of liquid in which the difference in pressures acting in the two arms of the tube causes the liquid to reach different heights in the two arms. Which of the following is NOT a limitation of the manometer?

Ans   ✗ 1. Large and bulky size

     ✓ 2. Difficulty in construction

     ✗ 3. Need for levelling

     ✗ 4. No over-range protection

Q.43 Which of the following keeps a record of receipts, issues and running balance of certain items of stock, especially of fitting items?

Ans   ✗ 1. Value account

     ✗ 2. Stock items

     ✗ 3. Quantity account

     ✓ 4. Bin card

Q.44 Which of the following types of trees belong to the endogenous trees?

Ans   ✗ 1. Deodar

     ✓ 2. Bamboo

     ✗ 3. Pine

     ✗ 4. Oak

Q.45 Calculate the hook length of the bar in one side with a diameter of 16 mm.

Ans   ✗ 1. 120 mm

     ✗ 2. 100 mm

     ✓ 3. 144 mm

     ✗ 4. 166 mm

Q.46 Select the correct option for the given statements related to the field test of cement.

Statement 1: When you insert your hand in a bag of cement, it should give you a hot feeling.
Statement 2: In adulteration test, take a pinch of cement and feel (rub) between the fingers; it should give a smooth feeling and not a gritty feeling.

Ans   ✗ 1. Statement 1 is true and statement 2 is false

     ✓ 2. Statement 1 is false and statement 2 is true

     ✗ 3. Both statement 1 and statement 2 are true

     ✗ 4. Both statement 1 and statement 2 are false

Q.47 A proper compaction of freshly prepared concrete results in:
(i) Achieving maximum strength of concrete
(ii) Expelling entrapped air in concrete
(iii) Change in fineness modulus of aggregate

Ans   ✗ 1. (i), (ii), and (iii)

     ✓ 2. Both (i) and (ii)

     ✗ 3. Only (i)

     ✗ 4. Only (ii)

Q.48

Following are the observations made on a closed traverse.

Line	Fore Bearing	Back Bearing
PQ	35° 20'	216° 40'
QR	155° 30'	336° 30'
RS	293°	113°
SP	10° 50'	191° 10'

If the bearing of Line RS is not affected by local attraction, the correction that needs to be applied to each angle is _____.

Ans
- ✓ 1. – 0° 40'
- ✗ 2. – 2° 40'
- ✗ 3. + 2° 40'
- ✗ 4. + 0° 40'

Q.49 According to IS 456:2000, for limit state method of collapse in flexure, which of the following assumptions is correct?

Ans
- ✗ 1. Plane section normal to axis does not remain plane after bending.
- ✗ 2. The tensile strength of the concrete is taken into account.
- ✓ 3. The maximum strain in concrete at the outermost compression fibre is taken as 0.0035 in bending.
- ✗ 4. The relationship between the stress strain distribution in concrete is assumed to be straight.

Q.50 Select the correct option for the given statements.

Statement 1: Bamboo can be utilised as a building material for scaffolding, bridges, houses and buildings.
Statement 2: Bamboo, like wood, is a natural composite material with a low strength-to-weight ratio and cannot be useful for structures.

Ans
- ✓ 1. Statement 1 is true and statement 2 is false
- ✗ 2. Both statement 1 and statement 2 are true
- ✗ 3. Both statement 1 and statement 2 are false
- ✗ 4. Statement 1 is false and statement 2 is true

Q.51 The shear strength of an RCC beam depends on which of the following factors?

Ans
- ✓ 1. The grade of the concrete
- ✗ 2. The zone of fine aggregate
- ✗ 3. The type of cement
- ✗ 4. The grade of the steel

Q.52 To get the corresponding lengths, we must _____ one breadth to the long wall and _____ one breadth from the short wall from the centre line.

Ans
- ✗ 1. subtract; add
- ✗ 2. add; add
- ✓ 3. add; subtract
- ✗ 4. subtract; subtract

Q.53 The total amount of dissolved salts allowable concentrations in mixing water in order to obtain a good strength concrete in terms of parts per million (ppm) as per IS 456 is _____.

Ans
- ✓ 1. 15000 ppm
- ✗ 2. 2000 ppm
- ✗ 3. 10000 ppm
- ✗ 4. 1000 ppm

Q.54 If a cantilever retaining wall is to retain soil to its full height H, for the analysis of bending moment at its base, the distance from the base where the total force due to backfill acts, is _____.

Ans
- ✗ 1. H
- ✗ 2. 0.5 H
- ✗ 3. 0.25 H
- ✓ 4. 0.33 H

Q.55 In a shrinkage limit experiment, mercury is used for:

Ans ✗ 1. prevent shrinkage of soil

✓ 2. determine dry volume of soil

✗ 3. determine volume at plastic limit

✗ 4. fill the voids of soil sample

Q.56 Which of the following is the most important property of the section in a compression member of any steel structure?

Ans ✗ 1. Weight of material

✗ 2. Section modulus

✓ 3. Moment of inertia

✗ 4. Modulus of elasticity

Q.57 _____ is a method of measuring the undrained shear strength of a cohesive soil.

Ans ✗ 1. torsion test

✗ 2. triaxial test

✗ 3. direct shear test

✓ 4. vane shear test

Q.58 The constant head permeability test is used for _____.

Ans ✗ 1. organic soil

✗ 2. clayey soil

✗ 3. fine grained soil

✓ 4. coarse grained soil

Q.59 Thermal expansion gives temperature stresses that are resisted by the weight of the rails. If the resistance provided per km of rail length is 700 kg, then find the maximum length of the continuous welded track that can be provided, neglecting all other factors.

Given for the rail:

Area of cross-section = 50 cm^2.

Modulus of elasticity = 2×10^6 kg/cm^2.

Coefficient of thermal expansion = 1.2×10^{-5}/°C

Rise in temperature = 35°C

Ans ✗ 1. 30 km

✗ 2. 60 m

✓ 3. 60 km

✗ 4. 30 m

Q.60 The precipitation is collected and measured in a rain gauge. The non-recording type rain gauge extensively used in India is _____.

Ans ✗ 1. weighing-bucket type rain gauge

✓ 2. Symon's rain gauge

✗ 3. tipping-bucket type rain gauge

✗ 4. float type rain gauge

Q.61 A reinforced concrete retaining structure that provides skeletal support to earthen materials is called _____.

Ans ✗ 1. lateral pressure

✓ 2. backfill

✗ 3. plasticity

✗ 4. erosion

Q.62 What is the meaning of 'ISMB 200' in the steel design?

Ans ✓ 1. Indian standard medium weight beams of depth 200 mm

✗ 2. Indian standard maximum weight beams of depth 200 mm

✗ 3. Indian standard mean weight beams of depth 200 mm

✗ 4. Indian standard mild weight beams of depth 200 mm

Q.63 The following is the table containing data recorded during curve setting by using the two-theodolite method.

Point	Chord Length	Tangential Angle	Deflection Angle	Theodolite reading at	
				Point of Curve	Point of Tangency
P1	12.26 m	0° 21' 25"	A	0° 21' 25"	
P2	20 m	1° 12' 5"		B	
P3	20 m	1° 12' 5"			C
P4	20 m	1° 12' 5"	3° 57' 40"		

The values of A, B and C are _____, _____ and _____, respectively.

Ans   ✗ 1. A = 0° 21' 25"; B = 1° 33' 30"; C = 182° 45' 35"

     ✗ 2. A = 0° 21' 25"; B = 1° 33' 30"; C = 177° 14' 25"

     ✅ 3. A = 0° 21' 25"; B = 1° 33' 30"; C = 357° 14' 25"

     ✗ 4. A = 0° 21' 25"; B = 1° 54' 55"; C = 177° 14' 25"

Q.64 Which of the following is a type of contouring method that can be effectively used in a hilly terrain by setting radial lines?

Ans   ✅ 1. Tacheometric method

     ✗ 2. Horizontal control method

     ✗ 3. Vertical control method

     ✗ 4. Method of cross-section

Q.65 During the particle board construction by pressing in the parallel plates process, what is the orientation of wood particles with respect to the plane of the board?

Ans   ✗ 1. $45°$

     ✅ 2. $0°$

     ✗ 3. $90°$

     ✗ 4. $30°$

Q.66 The specific energy of flow is the energy per unit weight of water with respect to the channel bottom as datum. As level of the channel bottom goes down, _____.

Ans   ✗ 1. specific energy decreases

     ✅ 2. specific energy increases

     ✗ 3. specific energy constant

     ✗ 4. specific energy is not depended on depth

Q.67 If a pitot tube is placed with its nose facing downstream, the liquid:

Ans   ✅ 1. falls in the tube to a height of $\dfrac{v^2}{2g}$

     ✗ 2. rises in the tube to a height of $\dfrac{v^2}{2g}$

     ✗ 3. does not rise in the tube

     ✗ 4. does not fall in the tube

Q.68 According to IS 456:2000, The value of design bond stress in limit state method for plain bars in tension depends on the:

Ans   ✗ 1. grade of the steel

     ✗ 2. length of the bar

     ✅ 3. grade of the concrete

     ✗ 4. none of the given option

Q.69 As per the Dicken's formula $Q_p = C.M^{3/4}$ for the calculation of peak drainage discharge, the term 'M' represents:

Ans   ✗ 1. time of concentration

     ✅ 2. catchment area in sq. km.

     ✗ 3. slope of the ground surface

     ✗ 4. rainfall intensity over the entire area

Q.70 If the magnetic bearing of the Sun at a certain place in the Southern Hemisphere during noon is 336° 29', then the magnetic declination at that place is _____.

Ans
✗ 1. 66° 29' W

✗ 2. 23° 31' W

✗ 3. 66° 29' E

✓ 4. 23° 31' E

Q.71 What is the standard atmospheric pressure at sea level?

Ans
✗ 1. 1.5 bar

✓ 2. 1.013 bar

✗ 3. 1013 mmHg

✗ 4. 1.3 bar

Q.72 Which of the given options is the best suited condition for energy recovery from municipal solid waste?

Ans
✗ 1. More moisture content

✗ 2. Presence of more non-renewable resources like glass

✗ 3. Presence of inorganic matter such as metal

✓ 4. High calorific value of solid waste

Q.73 Select the correct statement related to water distribution pipe systems.

Ans
✓ 1. Drain valves are provided at all the low points.

✗ 2. Drain valves are provided at all the high points.

✗ 3. Air valves are provided at all the low points.

✗ 4. Sluice valves are provided only once, at the start of pipe system.

Q.74 Find the moment of resistance of a balanced singly reinforced beam using the following data.
Grade of concrete : M20
Grade of steel : Fe415
b = width of the beam
d = effective depth of the beam
Use limit state method of design:

Ans
✗ 1. $2.66bd^2$

✗ 2. $2.96bd^2$

✓ 3. $2.76bd^2$

✗ 4. $2.07bd^2$

Q.75

Following are the observations made on a closed traverse.

Line	Fore Bearing	Back Bearing
AB	10° 20'	190° 20'
BC	155° 30'	336° 30'
CA	290°	112°

The total error is _____.

Ans
✓ 1. + 3° 0'

✗ 2. − 3° 0'

✗ 3. − 1° 0'

✗ 4. + 1° 0'

Q.76 Which of the following is NOT an advantage of the manometer?

Ans
✗ 1. Simple construction

✗ 2. Suitability for use in low-pressure applications

✓ 3. Small operating range

✗ 4. Better sensitivity

Q.77 To increase the seepage flow length, _____ are provided on the cut-off walls of the barrage or weir.

Ans ✗ 1. toe walls

✗ 2. impervious floors

✗ 3. inverted filters

✓ 4. sheet piles

Q.78 Warning signs are also known as _____.

Ans ✗ 1. prohibitory signs

✗ 2. mandatory signs

✗ 3. regulatory signs

✓ 4. cautionary signs

Q.79 Match the following.

Air Pollutant		Effect
I.	Carbon monoxide	A. Asphyxia
II.	Halogenated solvents	B. Attack(s) the liver
III.	Hydrocarbons	C. Cause(s) cancer

Ans ✗ 1. I-A, II-C, III-B

✗ 2. I-C, II-A, III-B

✓ 3. I-A, II-B, III-C

✗ 4. I-C, II-B, III-A

Q.80 The bearing of the magnetic meridian of a line is S 32° 10' W. If the magnetic declination is 7° 40' East, then the true bearing is _____.

Ans ✗ 1. S 25° 30' W

✓ 2. S 39° 50' W

✗ 3. 212° 10'

✗ 4. 205° 30'

Q.81 Select the option that is appropriate regarding the following two statements labelled Assertion and Reason.
Assertion: The orographic type of precipitation that is caused by moving masses of moist air may get lifted up to higher altitudes, due to presence of mountains as barriers.
Reason: Moving masses of moist air are lifted up to higher altitudes due to presence of mountains as barriers and consequently, they undergo cooling, condensation and precipitation.

Ans ✗ 1. Assertion is true, but Reason is false.

✗ 2. Both Assertion and Reason are false.

✓ 3. Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

✗ 4. Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.

Q.82 As per IS 3495 part-3 (1992), soluble salts, if present in bricks, will cause efflorescence on the surface of bricks. If the white deposits cover about 10% of the surface, the efflorescence is said to be _____.

Ans ✓ 1. slight

✗ 2. heavy

✗ 3. moderate

✗ 4. nil

Q.83 Consider the following conditions:
1. Concentrated loads are placed near beam supports.
2. The depth of beam section is small, and the beam is loaded uniformly.
The design of a beam is governed by shear under which of the following conditions?

Ans ✗ 1. Neither 1 nor 2

✗ 2. 2 only

✗ 3. 1 only

✓ 4. Both 1 and 2

Q.84 In measurement of masonry activity, no deduction is made for _____.

Ans
✔ 1. the end of purlin up to 0.05 m²

✘ 2. the end of a beam with cross sectional area > 0.05 m²

✘ 3. wall plates exceeding 10 cm thickness

✘ 4. bed plates exceeding 10 cm thickness

Q.85 Select the correct option for the given statements.
Statement 1: In level crossing, the canal water and drain water are allowed to intermingle with each other.
Statement 2: A level crossing is generally provided when a large canal and huge drainage approaches each other practically at the same level.

Ans
✘ 1. Statement 1 is true and statement 2 is false

✔ 2. Both statement 1 and statement 2 are true, and statement 2 is the correct explanation of statement 1

✘ 3. Both statement 1 and statement 2 are true, but statement 2 is not the correct explanation of statement 1

✘ 4. Statement 1 is false and statement 2 is true

Q.86 The Froude number is the ratio of two forces, which are:

Ans
✔ 1. inertia force and gravity force

✘ 2. inertia force and pressure force

✘ 3. viscous force and buoyancy force

✘ 4. buoyancy force and inertia force

Q.87 Pavements which have low or negligible flexural strength are called _____.

Ans
✘ 1. semi rigid pavements

✘ 2. rigid pavements

✔ 3. flexible pavements

✘ 4. cement concrete and gravel roads

Q.88 Which of the following types of pumps should be selected in order to pump the sewage from a septic tank to the water treatment system?

Ans
✘ 1. Vertical sump pump

✘ 2. Screw pump

✔ 3. Submersible pump

✘ 4. Progressive cavity pump

Q.89 Which of the following includes the cost of hire charges for the vehicle for an 8-hour working period in a day with the cost of the driver?

Ans
✘ 1. Labour cost

✔ 2. Cost of owing

✘ 3. Loading of the vehicle

✘ 4. Miscellaneous

Q.90 As per IRC, when designing pedestrian and traffic signals using approximate method for a two-phase system, the minimum initial period with pedestrian signal should NOT be less than:

Ans
✘ 1. 9 seconds

✔ 2. 7 seconds

✘ 3. 6 seconds

✘ 4. 4 seconds

Q.91 Select the option that is appropriate regarding the following two statements labelled Assertion and Reason.
Assertion: Check dams of low height are constructed across the tributaries of rivers at different stages to arrest the sediments in the catchment area.
Reason: Check dams serve the purpose of detention reservoirs and keep all the sediments in suspension.

Ans
✔ 1. Assertion is true but Reason is false.

✘ 2. Both Assertion and Reason are false.

✘ 3. Both Assertion and Reason are true and reason is the correct explanation of assertion.

✘ 4. Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

Q.92 The moment of inertia of a body is a measurement of:

Ans ✗ 1. its resistance against translation

✗ 2. its resistance against linear deformation

✗ 3. its resistance against shear

✓ 4. its resistance against rotation

Q.93 Municipal solid waste is also known as:

Ans ✗ 1. street sweepings

✗ 2. municipal rubbish

✓ 3. refuse

✗ 4. leachate

Q.94 Which of the following methods explains the process of underwater concreting?
(i) Pumping technique
(ii) Hydro valve method
(iii) Toggle bags method
(iv) Bagged concrete method

Ans ✓ 1. (i), (ii), (iii), and (iv)

✗ 2. Only (i), (ii), (iii)

✗ 3. Both (i) and (ii)

✗ 4. Only (i)

Q.95 A capillary tube of diameter 4 mm is dipped into a liquid of specific gravity 0.6. The liquid rises in the tube by 20 mm, making an angle of contact of 0° with the tube. Determine the surface tension of the liquid in contact with air and the glass tube.

Ans ✓ 1. 0.12 N/m

✗ 2. 0.08 N/m

✗ 3. 0.5 N/m

✗ 4. 1 N/m

Q.96 Calculate the most economic area of a rectangular channel section with width 'B' and depth 'y'.

Ans ✗ 1. By

✗ 2. $3y^2$

✓ 3. $2y^2$

✗ 4. y^2

Q.97 The relative error in a closed traverse survey with perimeter of 500 m is 1 in 2000. If the closing error lies in the fourth quadrant (Positive - Y and Negative - X), then the errors in latitude and departure, closer to two decimal point, will be _____, respectively.

Ans ✓ 1. $0.2 \text{ m and} - 0.15 \text{ m}$

✗ 2. $\sqrt{0 \cdot 2} \text{ m and} - \sqrt{0 \cdot 15} \text{ m}$

✗ 3. $0.2 \text{ m and } 0.15 \text{ m}$

✗ 4. $\sqrt{0 \cdot 2} \text{ m and } \sqrt{0 \cdot 15} \text{ m}$

Q.98 For zenith angles greater than 90°, the telescope of the total station will be _____.

Ans ✓ 1. pointing downwards

✗ 2. pointing to the left of the observer

✗ 3. pointing upwards

✗ 4. pointing to the right of the observer

Q.99 _____ is the best suited method of irrigation for arid conditions in hot and windy areas so as to achieve optimum usage of irrigation water.

Ans ✗ 1. Furrow irrigation method

✗ 2. Border strip method

✓ 3. Drip irrigation method

✗ 4. Sprinkler irrigation method

Q.100 During rainy season, if the rainfall is sufficient during the crop period, less quantity of irrigation water shall be required and therefore, the duty of the irrigation canal will be _____.

Ans ✗ 1. the same

✓ 2. more

✗ 3. No relation between the duty and the rainfall

✗ 4. less