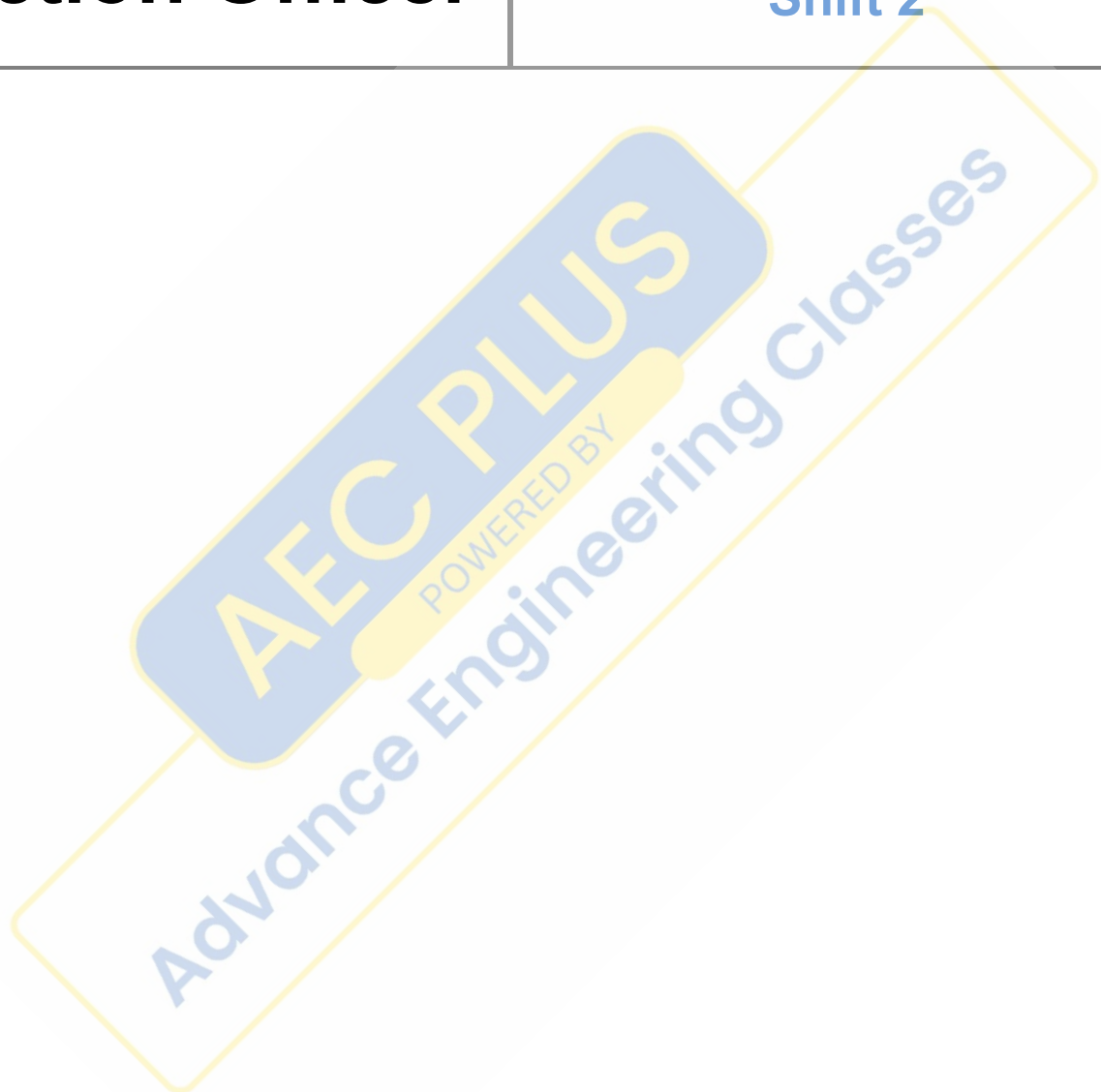


**DSSSB JE &
Section Officer**

**Previous Year Paper
(Civil) 27 June 2022
Shift 2**





GOVT. OF NCT OF DELHI
Delhi Subordinate Services Selection Board
FC-18, Institutional Area, Karkardooma, Delhi – 110092.
www.dsssbdelhigovt.nic.in

Participant ID	
Participant Name	
Test Center Name	
Test Date	27/06/2022
Test Time	12:30 PM - 2:30 PM
Subject	Junior Engineer (Civil) or Section Officer (Civil)

Section : Mental Ability

Q.1 Three of the following four number triads are alike in some manner and one is different. Identify the one which is different.

- Ans A. (17, 42, 5)
 B. (41, 102, 7)
 C. (23, 104, 9)
 D. (19, 55, 6)

Question ID : 1841222503

Q.2 What approximate value should come in place of the question mark (?) in the following expression?

$$32.996 + 6.956 \times 2.008 + 26.995 \div 2.989 - 7.021 = ?$$

- Ans A. 53
 B. 49
 C. 39
 D. 37

Question ID : 1841222504

Q.3 Which option figure would correctly fill the incomplete part indicated by a question mark (?) in the figure given below?



Ans

A.



B.



C.



D.



Question ID : 1841222496

Q.4 Select the correct mirror image of the given combination when the mirror is placed at 'PQ' as shown below.

4 3 5 2 & %



Ans

A.

% & 2 3 4

B.

% & 5 3 4

C.

% & 5 2 3 4

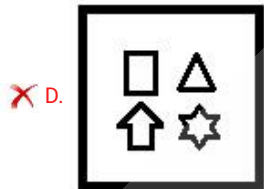
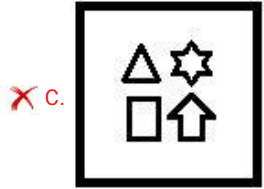
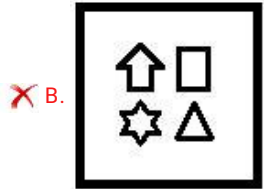
D.

% & 5 2 3 4

Question ID : 1841222499

Q.5 Three of the following four option figures are similar in a certain manner while one is different. Choose the odd one out.

Ans



Question ID : 1841222497

Q.6 Which number will replace the question mark (?) in the following series?

24, 23, 46, 43, 172, ?

- Ans
- ✗ A. 185
 - ✗ B. 344
 - ✗ C. 177
 - ✓ D. 167

Question ID : 1841222501

Q.7 Hardika is standing in a park facing the east direction. She turns 135 degrees anticlockwise. After that, she turns 90 degree anticlockwise. Then she finally turns 45 degrees anticlockwise. In which direction is she facing now?

- Ans
- ✓ A. South
 - ✗ B. West
 - ✗ C. North
 - ✗ D. Southwest

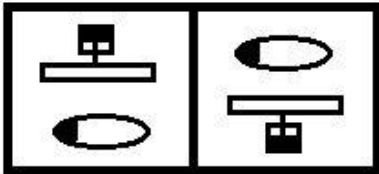
Question ID : 1841222490

Q.8 Select the figure amongst the option figures which has the same characteristics as the two figures given below.

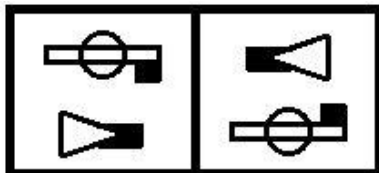


Ans

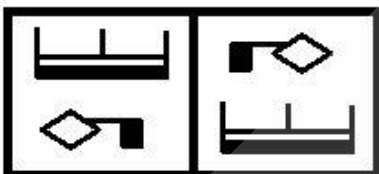
A.



B.



C.



D.



Question ID : 1841222498

Q.9 Among five rods P, Q, R, S and T; the weight of R is half the weight of S. The weight of Q is four times the weight of P. The weight of S is five times the weight of P. T is twice the weight of S. Which is the heaviest rod among these five rods?

Ans A. S

B. Q

C. R

D. T

Question ID : 1841222487

Q.10 Select the letter cluster that will replace the question mark (?) in the following series.

GNQ-7, ELO-15, CJM-31, AHK-63, ?

Ans A. XEI-125

B. YGH-127

C. YFI-127

D. YFI-132

Question ID : 1841222488

Q.11 Pointing to the photograph of a boy Nirvaan, a lady named Malti said, 'he is the son of my daughter's paternal grandfather Manohar's only son Vinod', if Parvati is the mother of Vinod, how is Parvati related to Malti?

- Ans
- A. Daughter-in-law
 - B. Mother-in-law
 - C. Sister-in-law
 - D. Mother

Question ID : 1841222491

Q.12 Three of the following four letter-clusters pairs are alike in some manner and one is different. Identify the one which is different.

- Ans
- A. CUT : UVD
 - B. RIM : NJS
 - C. GEM : NFH
 - D. PET : QAV

Question ID : 1841222493

Q.13 Seven friends named P, Q, R, S, T, U and V live on different floors of a building with floor numbered 1 to 7 from bottom to top. Equal numbers of persons live above and below U. Q lives on floor 2. P lives on the floor just below T's floor. S lives on the floor between P and U. Q lives on the floor between V and R. Three persons live between V and T. Who lives on floor 1?

- Ans
- A. R
 - B. V
 - C. T
 - D. S

Question ID : 1841222485

Q.14 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.

Statement:

- I. No calculator is table.
- II. No calculator is spoon.

Conclusions:

- I. No spoon is calculator.
- II. No spoon is table.

- Ans
- A. Either conclusion I or II follows
 - B. Only Conclusion I follows
 - C. Both conclusions I and II follow
 - D. Only Conclusion II follows

Question ID : 1841222486

Q.15 Three of the following four word pairs are alike in some manner and one is different. Identify the one which is different.

- Ans A. Colossus : Dwarf
 B. Authenticity : Accuracy
 C. Audacity : Timidity
 D. Picturesque : Ugly

Question ID : 1841222494

Q.16 If 20th November 2012 is Tuesday, what would be the day of the week on 20th November 2018?

- Ans A. Friday
 B. Thursday
 C. Wednesday
 D. Tuesday

Question ID : 1841222489

Q.17 If A & B means 'A is the sister of B', A # B means 'A is the husband of B', A @ B means 'A is the daughter of B'. How is N related to D in the expression 'N # G & V @ T # D'?

- Ans A. Father
 B. Son-in-law
 C. Paternal uncle
 D. Son

Question ID : 1841222492

Q.18 A statement is followed by two assumptions numbered I and II. Assuming everything in the statement to be true, decide which of the assumption/s is/are implicit in the statement.

Statement: The Urban Improvement Trust has issues notices to some property owners for unlawfully building and extending house structures which is not according to the approved plan of construction.

Assumptions:

- I. It is illegal to build houses if the neighbour's consent is not received before starting the construction.
II. The Urban Improvement Trust has the authority to regulate and monitor construction of houses and to intervene if any violation of laws is observed.

- Ans A. Only I is implicit.
 B. Neither I nor II are implicit.
 C. Only II is implicit.
 D. Both I and II are implicit.

Question ID : 1841222495

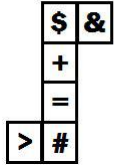
Q.19 Which number in the following series is wrong?

45, 47, 52, 62, 79, 105, 140, 192

- Ans
- A. 79
 - B. 105
 - C. 192
 - D. 140

Question ID : 1841222502

Q.20 Which symbol will be on the face opposite to the face with symbol '&', when the given sheet is folded to form a cube?



- Ans
- A. +
 - B. =
 - C. #
 - D. >

Question ID : 1841222500

Section : General Awareness

Q.1 Under Assam Accord of 1985, foreigners who had entered Assam before March 25, _____ were to be given citizenship.

- Ans
- A. 1954
 - B. 1971
 - C. 1981
 - D. 1966

Question ID : 1841222510

Q.2 World Table Tennis Day (WTTD) is celebrated annually on _____.

- Ans
- A. Jun 9
 - B. April 6
 - C. August 24
 - D. May 7

Question ID : 1841222512

Q.3 GSVL MKIII Project was approved in _____.

- Ans
- A. 2005
 - B. 2003
 - C. 2002
 - D. 2004

Question ID : 1841222522

Q.4 Battle of Chamkaur was fought between Guru Gobind Singh and _____.

- Ans
- A. Mughals
 - B. Britishers
 - C. Prorogues
 - D. Khaljis

Question ID : 1841222513

Q.5 Which of the following protocol provides a standard method for terminal devices and terminal-oriented processes to interface?

- Ans
- A. Transmission Control Protocol
 - B. Simple mail transport Protocol
 - C. Post office Protocol
 - D. Telnet Protocol

Question ID : 1841222507

Q.6 As of January 2022, who holds the position of Vice-Chairperson of NITI Aayog?

- Ans
- A. Prakash Loungani
 - B. Montek Singh Ahluwalia
 - C. Dr. Rajiv Kumar
 - D. Bibek Debroy

Question ID : 1841222518

Q.7 Which of the following schemes is aims to benefit the minority youths who do not have a formal school-leaving certificate to provide them formal education and skills, and enable them to seek better employment and livelihoods in the organized sector?

- Ans
- A. USTTAD
 - B. Seekho aur Kamao
 - C. Naya Savera
 - D. Nai Manzil

Question ID : 1841222508

Q.8 The Ustad Bismillah Khan Yuva Puraskar was introduced in the year

- Ans A. 2004
 B. 2005
 C. 2003
 D. 2006

Question ID : 1841222515

Q.9 What is the full name of the Chinese army which is called PLA?

- Ans A. People's Liberation Army
 B. People's Liberty Army
 C. Protection and Liberty Army
 D. Protection and Liberation Army

Question ID : 1841222514

Q.10 When was the National Minorities Development & Finance Corporation (NMDFC) was incorporated?

- Ans A. 1992
 B. 1993
 C. 1994
 D. 1991

Question ID : 1841222509

Q.11 In which of the following states the Kila Raipur (Qila Raipur) Sports Festival is organized?

- Ans A. Punjab
 B. Odisha
 C. Chhattisgarh
 D. Manipur

Question ID : 1841222517

Q.12 Salki Hydroelectric Project is located in

- Ans A. Bihar
 B. Karnataka
 C. Odisha
 D. Rajasthan

Question ID : 1841222521

Q.13 As per the census 2011, what was the proposition of children in the age group of 0-6 years in the total population of India?

- Ans A. 18.44
 B. 13.93
 C. 15.93
 D. 10.24

Question ID : 1841222520

Q.14 Which of the following is not an Antioxidants?

- Ans A. Selenium
 B. Lutein
 C. Globulin
 D. Beta-carotene

Question ID : 1841222523

Q.15 Sergey Brin was one of the founders of which of the following companies?

- Ans A. Twitter
 B. Google
 C. LinkedIn
 D. Facebook

Question ID : 1841222506

Q.16 Sardar Vallabhbhai Sports Enclave is located at _____.

- Ans A. Surat
 B. Porbandar
 C. Ahmadabad
 D. Rajkot

Question ID : 1841222511

Q.17 In which of the following years, right of child to free and compulsory education act was passed?

- Ans A. 1988
 B. 2009
 C. 1999
 D. 2005

Question ID : 1841222524

Q.18 Bhadra Wildlife Sanctuary is located in which of the following states?

- Ans A. Tamil Nadu
 B. Goa
 C. Karnataka
 D. Telangana

Question ID : 1841222519

Q.19 What is the full name of NFTs which are cryptographic assets on a blockchain with unique identification codes and metadata that distinguish them from each other?

- Ans A. Non-fungible takers
 B. Non-fragile tokens
 C. Null-fungible tokens
 D. Non-fungible tokens

Question ID : 1841222505

Q.20 Kishori Amonkar belongs to which of the following Gharana (community of musicians sharing a distinctive musical style)?

- Ans A. Jaipur Gharana
 B. Kanpur Gharana
 C. Agra Gharana
 D. Lucknow Gharana

Question ID : 1841222516

Section : Arithmetic Ability

Q.1 The average height of the girls of a class is 152 cm and the average height of the boys of the class is 5 cm more than the average of the class. If the number of girls is 10% less than the number of boys. What is the average height of the boys?

- Ans A. 163.25 cm
 B. 162.56 cm
 C. 154.32 cm
 D. 158.36 cm

Question ID : 1841222537

Q.2 The following table gives the exports and Imports (in 000's) from 2016 to 2021.

	Years				
	2016-17	2017-18	2018-19	2019-20	2020-21
Exports	25267	34625	36935	37236	45698
Imports	38916	42534	51235	46318	54631

Trade Deficit (TD) = Import- Export, TD% = TD/Export \times 100

Find the average of the total trade deficit of all the years.

- Ans A. 10774.2
 B. 10666.2
 C. 10554.2
 D. 10754.2

Question ID : 1841222542

Q.3 Two persons 24 km apart start at the same time and are together in 8 hrs if they walk in same direction. But if they walk in opposite direction, they are together in 4 hrs. What are their speeds in km/hr.

- Ans A. 4,1
 B. 4.5,1.5
 C. 2.5,3.5
 D. 4,2

Question ID : 1841222534

Q.4 The LCM of two numbers is 30 times of their HCF. The sum of the LCM and HCF is 1302. If one of the numbers is 140. Find the other number.

- Ans A. 375
 B. 378
 C. 377
 D. 376

Question ID : 1841222526

Q.5 Difference between the time taken in covering a certain journey decrease by 35min. When the speed is increased from 5 km/hr to 10 km/hr. What is the difference between the time taken when the same distance is covered at a speed of 30 km/hr and 15 km/hr?

- Ans A. 11.66 min
 B. 12.55 min
 C. 12.58 min
 D. 12.33 min

Question ID : 1841222535

Q.6 Rate of inflation is 1500% per annum. What is the value of an article two years from now if it costs Rs 5 today?

- Ans A. Rs 1324
 B. Rs 1280
 C. Rs 1342
 D. Rs 1256

Question ID : 1841222528

Q.7 Find the percentage deviation(formula) of Malaysia from the average value of production per country for each of the 6 countries.(UPTO one decimal)

- Ans A. 38.4
 B. 33.5
 C. 35.2
 D. 34.6

Question ID : 1841222544

Q.8 Two identical circles intersect so that their centres and the points at which they intersect, form a square of side 2 cm. The area in sq cm of the portion that is common to the two circles is:

- Ans A. $3\pi-4$
 B. $2\pi-1$
 C. $\pi-4$
 D. $2\pi-4$

Question ID : 1841222539

Q.9 ABC is a right-angled triangle BD is perpendicular to AC. If AD = 9 cm and Dc = 4 cm then BD = ?

- Ans A. 4 cm
 B. 6 cm
 C. 5 cm
 D. 3 cm

Question ID : 1841222538

Q.10 Simple interest on a certain sum at 3% per annum for 2 years is Rs 45. What is the compound annually on the same sum for the same period of time?

- Ans A. Rs 46.70
 B. Rs 48.70
 C. Rs 45.70
 D. Rs 43.70

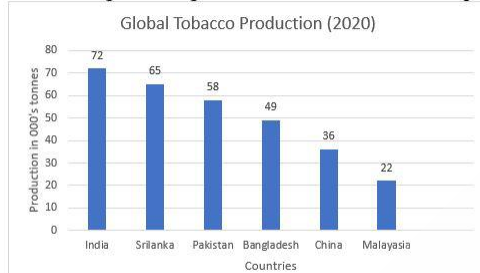
Question ID : 1841222531

Q.11 Find the length of the common chord of two circles whose radii are 3 cm and 4cm respectively, whose center is 6 cm apart. (Round off value)

- Ans A. 3.8 cm
 B. 3.7 cm
 C. 3.1 cm
 D. 3.6 cm

Question ID : 1841222541

Q.12 The following bar chart gives the information of the tobacco production in 6 countries of the world.



What percentage of India's tobacco production for the year 2020 when compared to the total production of remaining countries.

- Ans A. 23.2
 B. 23.5
 C. 23.4
 D. 23.8

Question ID : 1841222543

Q.13 When the speed of the train is increased by 10% it takes 10min less to cover the same distance. What is the time taken to cover the same distance with the actual speed?

- Ans A. 110 min
 B. 115 min
 C. 118 min
 D. 112 min

Question ID : 1841222533

Q.14 How many Zeros will be there at the end of the expression $N = 9 \times 18 \times 27 \times \dots \times 999$?

- Ans A. 23
 B. 26
 C. 24
 D. 25

Question ID : 1841222527

Q.15 Find the height of the cylinder whose volume is 480 cm^3 and the area of the base is 32 cm^2 .

- Ans A. 15 cm
 B. 16 cm
 C. 14 cm
 D. 17 cm

Question ID : 1841222540

Q.16 An electrical contractor purchased a certain amount of copper wire of which 15% was stolen. After using 80% of the remainder, he had left 34 metres of wire left. How much wire did he purchase?

- Ans A. 150 m
 B. 165 m
 C. 200 m
 D. 203 m

Question ID : 1841222529

Q.17 The average of 8 two-digit positive integers is x . However, one number AB is taken as BA then the average increases to $x+1.75$. What is the value of B-A?

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

Question ID : 1841222536

Q.18 The LCM of 48, 92 and N is 5520. If their HCF is 4 then which of the following can be one of the values of N?

- Ans A. 120
 B. 125
 C. 123
 D. 119

Question ID : 1841222525

Q.19 X borrows a certain sum from Y at a certain rate of simple interest for 2 years. He lends this sum to Z at the same rate of interest, but compounded annually for the same period. At the end of 2 years, he receives Rs 3200 as compound interest, but paid Rs 2800 as simple interest. What is the rate of interest?

- Ans A. 13.29%
 B. 14.69%
 C. 15.29%
 D. 14.29%

Question ID : 1841222532

Q.20 A seller offers discounts on the basis of the number of items purchased. He gives a discount of 5% when 4 items are bought and a discount of 12% when 10 items are bought. If the profit he makes in each case is the same, find the ratio of the marked price to the cost price of the article.

- Ans
- A. 4 : 5
 - B. 6 : 5
 - C. 5 : 4
 - D. 5 : 6

Question ID : 1841222530

Section : General English

Q.1 Select the most appropriate synonym of the given word.

AFFABLE

- Ans
- A. Irritable
 - B. miserable
 - C. Rude
 - D. Friendly

Question ID : 1841222548

Q.2 Select the most appropriate option to fill in the blank.

Some miscreants set a public bus _____ fire when the protest turned violent.

- Ans
- A. to
 - B. in
 - C. for
 - D. on

Question ID : 1841222546

Q.3 Select the most appropriate option to fill in the blank.

She didn't _____ any gifts from her friends and relatives _____ her parents.

- Ans
- A. Accept; except
 - B. Except; accept
 - C. Accept; accept
 - D. Except; except

Question ID : 1841222551

Q.4 Complete the following proverb.
_____ than words.

- Ans
- A. doing things matters more
 - B. pictures speak better
 - C. actions speak louder
 - D. objects are better

Question ID : 1841222552

Q.5 Select the most appropriate option to fill in the blank.
He was so _____ about his losses in the business that he could hardly sleep at night.

- Ans A. Anxious
 B. Confident
 C. Inattentive
 D. Careful

Question ID : 1841222559

Q.6 Select the most appropriate meaning of the given idiom.

give someone enough rope

- Ans A. to allow someone freedom of action
 B. to give many directives
 C. to give advice to someone
 D. to train someone thoroughly

Question ID : 1841222554

Q.7 Select the most appropriate option to fill in the blank.

They have reconciled _____ the fact that their father is no more now.

- Ans A. up
 B. for
 C. to
 D. at

Question ID : 1841222545

Q.8 Complete the following proverb.
beggars can't be _____.

- Ans A. Rich
 B. Choosers
 C. Wealthy
 D. Losers

Question ID : 1841222553

Q.9 Select the most appropriate option to fill in the blank.

You have to accept the fact that you failed because you _____ - hard enough.

- Ans A. didn't work
 B. will not work
 C. aren't working
 D. haven't worked

Question ID : 1841222547

Q.10 Select the sentence part which has an error in spelling. If there is no error, select 'No error'.

It is prohibited to smoke a cigarette in the auditoriam.

- Ans A. in the auditoriam.
 B. It is prohibited
 C. No error
 D. to smoke a cigarette

Question ID : 1841222557

Q.11 Select the most appropriate antonym of the given word.

REPRIMAND

- Ans A. Chide
 B. Censure
 C. Commend
 D. Blame

Question ID : 1841222550

Q.12 Select the sentence part which has an error in spelling. If there is no error, select 'No error'.

He has never got success in his carrere as he keeps changing his jobs.

- Ans A. He has never got success
 B. in his carrere as he keeps
 C. No error
 D. changing his jobs.

Question ID : 1841222556

Q.13 Select the most appropriate synonym of the given word.

PLACID

- Ans A. Agitated
 B. Violent
 C. Calm
 D. Disturbed

Question ID : 1841222549

Q.14 Select the most appropriate idiom to fill in the blank.
Please tell me _____ what the issue was, why they were fighting.

- Ans A. in hot water
 B. in a nutshell
 C. in the bag
 D. in the pink

Question ID : 1841222555

Q.15 Select the sentence which is meaningful and grammatically correct.

- Ans A. On the Delhi Meerut Expressway since January toll tax the government has levied.
- B. The government has levied since January on the Delhi Meerut Expressway toll tax.
- C. Toll tax since January on the Delhi Meerut Expressway the government has levied
- D. The government has levied toll tax on the Delhi Meerut Expressway since January.

Question ID : 1841222558

Comprehension:

Read the following passage and answer the questions given after it.

Ötzi the Iceman is the well-preserved, 5,300-year-old mummy that caused an international sensation when it was dug out of a glacier high in the Italian Alps in 1991. "He is so important because, for the first time, we have the possibility of knowing a Copper Age individual who died in the same situation as he had lived," said Katharina Hersel, a spokesperson for the South Tyrol Museum of Archaeology in Bolzano, Italy, where Ötzi is housed.

Since his discovery, Ötzi has undergone extensive scientific analyses, which have broadened our understanding of what Ötzi's life was like and how he died, as well as revealed more about the time period in which he lived.

The initial analyses focused on the Iceman's physical characteristics. Ötzi would have stood about 5 feet, 3 inches (1.60 m) tall and weighed around 110 pounds (50 kilograms). From the low levels of subcutaneous fat on his body, researchers concluded that Ötzi had a lean, wiry build. An analysis of the osteons (microscopic structures in bone that are frequently used to determine the age of a skeleton) indicated that he was in his 40s when he died.

"Ötzi was fit but not completely healthy," said Hersel. Analyses demonstrated that he suffered from several ailments, including Lyme disease and intestinal parasites.

Microscopic analysis of his stomach found evidence of *Helicobacter pylori*, a bacterium that causes stomach ulcers and gastritis. He also has extensive wear on his teeth, and his joints — especially his hips, shoulder, knees and spine — showed signs of significant wear and tear, suggesting he suffered from arthritis. Moreover, his lungs were coated with soot, indicating that he likely spent a lot of time around open fires during his life.

Detailed analyses of Ötzi's artifacts have also revealed much about the ancient man's life and times. Scattered bits of leather, plant fiber, animal hide, string, his ax and an unfinished bow were found near him when he was first dug out of the ice. Later archaeological excavations at the site uncovered additional artifacts, including more hide, leather, a knife, an arrow quiver and pieces of Ötzi's clothing. In fact, archaeologists were able to reconstruct the iceman's wardrobe, which consisted of a cloak, leggings, a belt, a loincloth, a bearskin cap and even shoes. The latter were made out of deer hide stretched on a string netting and were insulated with grass. Archaeologists also found a leather pouch containing a tinder fungus, a scraper, a boring tool, a bone awl and a flint flake.

SubQuestion No : 16

Q.16 Which of the following items was found in the later excavations?

- Ans A. unfinished bow
- B. his ax
- C. string
- D. Knife

Question ID : 1841222563

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Read the following passage and answer the questions given after it.

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Detailed analyses of Ötzi's artifacts have also revealed much about the ancient man's life and times. Scattered bits of leather, plant fiber, animal hide, string, his ax and an unfinished bow were found near him when he was first dug out of the ice. Later archaeological excavations at the site uncovered additional artifacts, including more hide, leather, a knife, an arrow quiver and pieces of Ötzi's clothing. In fact, archaeologists were able to reconstruct the iceman's wardrobe, which consisted of a cloak, leggings, a belt, a loincloth, a bearskin cap and even shoes. The latter were made out of deer hide stretched on a string netting and were insulated with grass. Archaeologists also found a leather pouch containing a tinder fungus, a scraper, a boring tool, a bone awl and a flint flake.

SubQuestion No : 17

Q.17 "The latter were made out of deer hide stretched on a string netting". The word 'latter' here refers to

- Ans A. Shoes
 B. Belt
 C. Cloak
 D. Leggings

Question ID : 1841222565

Comprehension:

Read the following passage and answer the questions given after it.

Ötzi the Iceman is the well-preserved, 5,300-year-old mummy that caused an international sensation when it was dug out of a glacier high in the Italian Alps in 1991. "He is so important because, for the first time, we have the possibility of knowing a Copper Age individual who died in the same situation as he had lived," said Katharina Hersel, a spokesperson for the South Tyrol Museum of Archaeology in Bolzano, Italy, where Ötzi is housed.

Since his discovery, Ötzi has undergone extensive scientific analyses, which have broadened our understanding of what Ötzi's life was like and how he died, as well as revealed more about the time period in which he lived.

The initial analyses focused on the Iceman's physical characteristics. Ötzi would have stood about 5 feet, 3 inches (1.60 m) tall and weighed around 110 pounds (50 kilograms). From the low levels of subcutaneous fat on his body, researchers concluded that Ötzi had a lean, wiry build. An analysis of the osteons (microscopic structures in bone that are frequently used to determine the age of a skeleton) indicated that he was in his 40s when he died.

"Ötzi was fit but not completely healthy," said Hersel. Analyses demonstrated that he suffered from several ailments, including Lyme disease and intestinal parasites.

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SubQuestion No : 18

Q.18 What helped the scientist find out the age of Otzi the Iceman?

- Ans
- A. examination of his teeth, and his joints
 - B. Microscopic analysis of his stomach
 - C. Low levels of subcutaneous fat on his body
 - D. analysis of the osteons in his bones

Question ID : 1841222562

Comprehension:

Read the following passage and answer the questions given after it.

Ötzi the Iceman is the well-preserved, 5,300-year-old mummy that caused an international sensation when it was dug out of a glacier high in the Italian Alps in 1991. "He is so important because, for the first time, we have the possibility of knowing a Copper Age individual who died in the same situation as he had lived," said Katharina Hersel, a spokesperson for the South Tyrol Museum of Archaeology in Bolzano, Italy, where Ötzi is housed.

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SubQuestion No : 19

Q.19 How did the scientists know that Otzi had perhaps spent a lot of time around open fires during his life?

- Ans
- A. from the stomach ulcers
 - B. from intestinal parasites
 - C. from the wear and tear of hi teeth
 - D. from soot in his lungs

Question ID : 1841222564

Comprehension:

Read the following passage and answer the questions given after it.

Ötzi the Iceman is the well-preserved, 5,300-year-old mummy that caused an international sensation when it was dug out of a glacier high in the Italian Alps in 1991. "He is so important because, for the first time, we have the possibility of knowing a Copper Age individual who died in the same situation as he had lived," said Katharina Hersel, a spokesperson for the South Tyrol Museum of Archaeology in Bolzano, Italy, where Ötzi is housed.

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Microscopic analysis of his stomach found evidence of *Helicobacter pylori*, a bacterium that causes stomach ulcers and gastritis. He also has extensive wear on his teeth, and his joints — especially his hips, shoulder, knees and spine — showed signs of significant wear and tear, suggesting he suffered from arthritis. Moreover, his lungs were coated with soot, indicating that he likely spent a lot of time around open fires during his life.

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SubQuestion No : 20

Q.20 The passage mainly:

- Ans A. describes the scientific findings about the physical features and artifacts of Otzi the Iceman.
- B. explains why the discovery of Otzi the Iceman is important.
- C. narrates the life story of Otzi the Iceman.
- D. analyses the diseases Otzi the Iceman had.

Question ID : 1841222561

Section : General Hindi

Q.1 'सकीना ने मुस्कुराकर आने वाले मेहमानों का स्वागत कि' वाक्य में मुस्कुराकर उदाहरण है:

- Ans A. समयवाचक क्रियाविशेषण का
- B. रीतिवाचक क्रियाविशेषण का
- C. स्थानवाचक क्रियाविशेषण का
- D. परिमाणवाचक क्रियाविशेषण का

Question ID : 1841222569

Q.2 'बेटी मारी गई।' वाक्य में कारक है:

- Ans A. अपादान
 B. सम्प्रदान
 C. करण
 D. कर्म

Question ID : 1841222566

Q.3 निम्न में से 'नौका' का पर्यायवाची शब्द है:

- Ans A. तरिणी
 B. सफरी
 C. तटिनी
 D. तड़ित

Question ID : 1841222575

Q.4 'असलम इस बार गर्मी की छुट्टी में कहाँ जा रहा है?' वाक्य उदाहरण है:

- Ans A. आसन्न भूल काल का
 B. सामान्य वर्तमान काल का
 C. तात्कालिक वर्तमान काल का
 D. संदिग्ध वर्तमान काल का

Question ID : 1841222579

Q.5 'तपोभूमि' का संधि विच्छेद है:

- Ans A. त + उपभूमि
 B. तपो + भूमि
 C. तपः + भूमि
 D. तप + भूमि

Question ID : 1841222571

Q.6 'उपर्युक्त' का संधि विच्छेद है:

- Ans A. उप + युक्त
 B. उपरी + युक्त
 C. उपरि + उक्त
 D. उपर + उक्त

Question ID : 1841222570

Q.7 'लोहा लेना' मुहावरे का अर्थ है:

- Ans A. लोहे की वस्तु खरीदना
 B. लड़ाई करना
 C. श्रेष्ठता स्वीकार करना
 D. बुरी तरह हराना

Question ID : 1841222576

Q.8 उचित मुहावरे से वाक्य पूर्ण कीजिए।

धर्म से प्रेम करो, पर उसके पीछे _____ से तो दुनिया नहीं चलती।

- Ans
- A. अंधेरखाते
 - B. अंधा बनाने
 - C. अंधा बनने
 - D. अंधाधुध लुटाने

Question ID : 1841222578

Q.9 उचित विकल्प चुन कर वाक्य पूर्ण कीजिए।

जो _____ करता है उसका आज या कल सर्वनाश हो ही जाता है।

- Ans
- A. गर्व
 - B. अनुकंपा
 - C. अभिमान
 - D. घमंड

Question ID : 1841222580

Q.10 'आविर्भाव' का विलोम शब्द है:

- Ans
- A. अनुभाव
 - B. पुरातन
 - C. तिरोभाव
 - D. पराभाव

Question ID : 1841222573

Q.11 निम्न में 'मछली' का पर्यायवाची है:

- Ans
- A. गाछ
 - B. झख
 - C. शर
 - D. बीजुरी

Question ID : 1841222574

Q.12 'अल्पायु' का विलोम शब्द है:

- Ans
- A. अधिआयु
 - B. अमर
 - C. चिरंजीव
 - D. दीर्घायु

Question ID : 1841222572

Q.13 निम्न में से किस संज्ञा शब्द में 'वान' प्रत्यय लगाने से नवीन विशेषण शब्द बनेगा?

- Ans A. करुणा
 B. बल
 C. शांति
 D. श्री

Question ID : 1841222567

Q.14 निम्न में से किस लोकोक्ति का अर्थ 'परिश्रम किसी का, लाभ किसी और को' होगा?

- Ans A. अंडे सेवे कोई, बच्चे लेवे कोई
 B. अंधे के हाथ बटेर लगना
 C. अंधा बगुला कीचड़ खाए
 D. अंधा क्या चाहे, दो आँखे

Question ID : 1841222577

Q.15 'तनिक' उदाहरण है:

- Ans A. परिमाण वाचक क्रियाविशेषण का
 B. रीतिवाचक क्रियाविशेषण का
 C. समयवाचक क्रियाविशेषण का
 D. स्थानवाचक क्रियाविशेषण का

Question ID : 1841222568

Comprehension:

दिए गए गद्यांश को ध्यानपूर्वक पढ़ें और दिए गए प्रश्नों का उत्तर दें।

छठी शताब्दी के अंतिम चरण में गुप्त साम्राज्य के पतन के साथ भारतीय इतिहास के एक महान युग का अंत हो गया। इसके बड़े दूरगामी राजनीतिक परिणाम हुए। पिछले एक हजार वर्ष तक मगध भारत का राजनीतिक गुरुत्वाकर्षण बिंदु रहा था, परन्तु अब उत्तर भारत की राजनीतिक शक्ति का केंद्र कन्नौज हो गया। सातवीं शताब्दी के प्रारंभ में कन्नौज के राजसिंहासन पर हर्ष के राज्यारोहण के साथ कन्नौज के उत्कर्ष की इस सीमा तक अभिवृद्धि हुई कि अगली शताब्दी में भारत की तीन शक्तियाँ इस पर आधिपत्य के लिए आपस में संघर्ष करती रहीं। किसी महान साम्राज्य के पतन का तात्कालिक परिणाम यह होता है कि स्वतंत्र सत्ता के विविध केंद्र उठ खड़े होते हैं। यही गुप्त साम्राज्य के पतन के बाद हुआ। अनेक दुर्गुणों सहित बहु-राज्यवादी व्यवस्था इस युग के राजनीतिक, सामाजिक और आर्थिक जीवन का मूलाधार थी। राजनीतिक परिवर्तन के साथ इस युग में व्यापक सामाजिक और आर्थिक परिवर्तन भी आए। जाति-व्यवस्था अत्यधिक जटिल हो गई और समाज रूढ़िवादी हो गया। अर्थव्यवस्था के पतन के चिह्न प्रकट होने लगे और सर्वत्र सामंतवाद की जड़ें मज़बूत होने लगीं। हर्षवर्धन के शासनकाल तक कुछ सीमा तक उत्तर भारत की राजनीतिक एकता अक्षुण्ण बनी रही। परंतु हर्ष की मृत्यु (647 ई.) के बाद उसका राजवंश और राज्य दोनों ही नष्ट हो गए और संपूर्ण उत्तर भारत में राजनीतिक अराजकता की स्थिति व्याप्त हो गई।

SubQuestion No : 16

Q.16 किसी महान साम्राज्य के पतन का तात्कालिक परिणाम होता है:

- Ans A. स्वतंत्र सत्ता के विविध केंद्रों का जन्म।
 B. कमज़ोर शासकों का सिंहासन पर बैठना।
 C. सत्ता के केंद्र का परिवर्तित हो जाना।
 D. विदेशी आक्रमण।

Question ID : 1841222583

Comprehension:

दिए गए गद्यांश को ध्यानपूर्वक पढ़ें और दिए गए प्रश्नों के उत्तर दें।

छठी शताब्दी के अंतिम चरण में गुप्त साम्राज्य के पतन के साथ भारतीय इतिहास के एक महान युग का अंत हो गया। इसके बड़े दूरगामी राजनीतिक परिणाम हुए। पिछले एक हजार वर्ष तक मगध भारत का राजनीतिक गुरुत्वाकर्षण बिंदु रहा था, परन्तु अब उत्तर भारत की राजनीतिक शक्ति का केंद्र कन्नौज हो गया। सातवीं शताब्दी के प्रारंभ में कन्नौज के राजसिंहासन पर हर्ष के राज्यारोहण के साथ कन्नौज के उत्कर्ष की इस सीमा तक अभिवृद्धि हुई कि अगली शताब्दी में भारत की तीन शक्तियाँ इस पर आधिपत्य के लिए आपस में संघर्ष करती रहीं। किसी महान साम्राज्य के पतन का तात्कालिक परिणाम यह होता है कि स्वतंत्र सत्ता के विविध केंद्र उठ खड़े होते हैं। यही गुप्त साम्राज्य के पतन के बाद हुआ। अनेक दुर्गुणों सहित बहु-राज्यवादी व्यवस्था इस युग के राजनीतिक, सामाजिक और आर्थिक जीवन का मूलाधार थी। राजनीतिक परिवर्तन के साथ इस युग में व्यापक सामाजिक और आर्थिक परिवर्तन भी आए। जाति-व्यवस्था अत्यधिक जटिल हो गई और समाज रूढ़िवादी हो गया। अर्थव्यवस्था के पतन के चिह्न प्रकट होने लगे और सर्वत्र सामंतवाद की जड़ें मज़बूत होने लगीं। हर्षवर्धन के शासनकाल तक कुछ सीमा तक उत्तर भारत की राजनीतिक एकता अक्षुण्ण बनी रही। परन्तु हर्ष की मृत्यु (647 ई.) के बाद उसका राजवंश और राज्य दोनों ही नष्ट हो गए और संपूर्ण उत्तर भारत में राजनीतिक अराजकता की स्थिति व्याप्त हो गई।

SubQuestion No : 17

Q.17 भारत में सातवीं शताब्दी में उत्पन्न हुई बहु-राज्यवादी व्यवस्था का परिणाम नहीं हुआ:

- Ans A. जाति-व्यवस्था अधिक जटिल हो गई।
 B. अर्थव्यवस्था में सुधार हुआ व्यापार बढ़ा।
 C. सामंतवाद की जड़ें मज़बूत हुईं।
 D. समाज रूढ़िवाद से ग्रस्त हो गया।

Question ID : 1841222586

Comprehension:

दिए गए गद्यांश को ध्यानपूर्वक पढ़ें और दिए गए प्रश्नों के उत्तर दें।

छठी शताब्दी के अंतिम चरण में गुप्त साम्राज्य के पतन के साथ भारतीय इतिहास के एक महान युग का अंत हो गया। इसके बड़े दूरगामी राजनीतिक परिणाम हुए। पिछले एक हजार वर्ष तक मगध भारत का राजनीतिक गुरुत्वाकर्षण बिंदु रहा था, परन्तु अब उत्तर भारत की राजनीतिक शक्ति का केंद्र कन्नौज हो गया। सातवीं शताब्दी के प्रारंभ में कन्नौज के राजसिंहासन पर हर्ष के राज्यारोहण के साथ कन्नौज के उत्कर्ष की इस सीमा तक अभिवृद्धि हुई कि अगली शताब्दी में भारत की तीन शक्तियाँ इस पर आधिपत्य के लिए आपस में संघर्ष करती रहीं। किसी महान साम्राज्य के पतन का तात्कालिक परिणाम यह होता है कि स्वतंत्र सत्ता के विविध केंद्र उठ खड़े होते हैं। यही गुप्त साम्राज्य के पतन के बाद हुआ। अनेक दुर्गुणों सहित बहु-राज्यवादी व्यवस्था इस युग के राजनीतिक, सामाजिक और आर्थिक जीवन का मूलाधार थी। राजनीतिक परिवर्तन के साथ इस युग में व्यापक सामाजिक और आर्थिक परिवर्तन भी आए। जाति-व्यवस्था अत्यधिक जटिल हो गई और समाज रूढ़िवादी हो गया। अर्थव्यवस्था के पतन के चिह्न प्रकट होने लगे और सर्वत्र सामंतवाद की जड़ें मज़बूत होने लगीं। हर्षवर्धन के शासनकाल तक कुछ सीमा तक उत्तर भारत की राजनीतिक एकता अक्षुण्ण बनी रही। परन्तु हर्ष की मृत्यु (647 ई.) के बाद उसका राजवंश और राज्य दोनों ही नष्ट हो गए और संपूर्ण उत्तर भारत में राजनीतिक अराजकता की स्थिति व्याप्त हो गई।

SubQuestion No : 18

Q.18 निम्न में से 'कर्ष' शब्द में किस उपसर्ग का प्रयोग कर उत्कर्ष का विलोम बनेगा?

- Ans A. अनु
 B. अधि
 C. अप
 D. वि

Question ID : 1841222585

Comprehension:

दिए गए गद्यांश को ध्यानपूर्वक पढ़ें और दिए गए प्रश्नों का उत्तर दें।

छठी शताब्दी के अंतिम चरण में गुप्त साम्राज्य के पतन के साथ भारतीय इतिहास के एक महान युग का अंत हो गया। इसके बड़े दूरगामी राजनीतिक परिणाम हुए। पिछले एक हजार वर्ष तक मगध भारत का राजनीतिक गुरुत्वाकर्षण बिंदु रहा था, परन्तु अब उत्तर भारत की राजनीतिक शक्ति का केंद्र कन्नौज हो गया। सातवीं शताब्दी के प्रारंभ में कन्नौज के राजसिंहासन पर हर्ष के राज्यारोहण के साथ कन्नौज के उत्कर्ष की इस सीमा तक अभिवृद्धि हुई कि अगली शताब्दी में भारत की तीन शक्तियाँ इस पर आधिपत्य के लिए आपस में संघर्ष करती रहीं। किसी महान साम्राज्य के पतन का तात्कालिक परिणाम यह होता है कि स्वतंत्र सत्ता के विविध केंद्र उठ खड़े होते हैं। यही गुप्त साम्राज्य के पतन के बाद हुआ। अनेक दुर्गुणों सहित बहु-राज्यवादी व्यवस्था इस युग के राजनीतिक, सामाजिक और आर्थिक जीवन का मूलाधार थी। राजनीतिक परिवर्तन के साथ इस युग में व्यापक सामाजिक और आर्थिक परिवर्तन भी आए। जाति-व्यवस्था अत्यधिक जटिल हो गई और समाज रूढ़िवादी हो गया। अर्थव्यवस्था के पतन के चिह्न प्रकट होने लगे और सर्वत्र सामंतवाद की जड़ें मज़बूत होने लगीं। हर्षवर्धन के शासनकाल तक कुछ सीमा तक उत्तर भारत की राजनीतिक एकता अक्षुण्ण बनी रही। परन्तु हर्ष की मृत्यु (647 ई.) के बाद उसका राजवंश और राज्य दोनों ही नष्ट हो गए और संपूर्ण उत्तर भारत में राजनीतिक अराजकता की स्थिति व्याप्त हो गई।

SubQuestion No : 19

Q.19 सम्राट हर्ष की मृत्यु कब हुई?

- Ans A. 648 ई.
 B. 647 ई.
 C. 647 ई.पूर्व
 D. 648 ई.पूर्व

Question ID : 1841222582

Comprehension:

दिए गए गद्यांश को ध्यानपूर्वक पढ़ें और दिए गए प्रश्नों का उत्तर दें।

छठी शताब्दी के अंतिम चरण में गुप्त साम्राज्य के पतन के साथ भारतीय इतिहास के एक महान युग का अंत हो गया। इसके बड़े दूरगामी राजनीतिक परिणाम हुए। पिछले एक हजार वर्ष तक मगध भारत का राजनीतिक गुरुत्वाकर्षण बिंदु रहा था, परन्तु अब उत्तर भारत की राजनीतिक शक्ति का केंद्र कन्नौज हो गया। सातवीं शताब्दी के प्रारंभ में कन्नौज के राजसिंहासन पर हर्ष के राज्यारोहण के साथ कन्नौज के उत्कर्ष की इस सीमा तक अभिवृद्धि हुई कि अगली शताब्दी में भारत की तीन शक्तियाँ इस पर आधिपत्य के लिए आपस में संघर्ष करती रहीं। किसी महान साम्राज्य के पतन का तात्कालिक परिणाम यह होता है कि स्वतंत्र सत्ता के विविध केंद्र उठ खड़े होते हैं। यही गुप्त साम्राज्य के पतन के बाद हुआ। अनेक दुर्गुणों सहित बहु-राज्यवादी व्यवस्था इस युग के राजनीतिक, सामाजिक और आर्थिक जीवन का मूलाधार थी। राजनीतिक परिवर्तन के साथ इस युग में व्यापक सामाजिक और आर्थिक परिवर्तन भी आए। जाति-व्यवस्था अत्यधिक जटिल हो गई और समाज रूढ़िवादी हो गया। अर्थव्यवस्था के पतन के चिह्न प्रकट होने लगे और सर्वत्र सामंतवाद की जड़ें मज़बूत होने लगीं। हर्षवर्धन के शासनकाल तक कुछ सीमा तक उत्तर भारत की राजनीतिक एकता अक्षुण्ण बनी रही। परन्तु हर्ष की मृत्यु (647 ई.) के बाद उसका राजवंश और राज्य दोनों ही नष्ट हो गए और संपूर्ण उत्तर भारत में राजनीतिक अराजकता की स्थिति व्याप्त हो गई।

SubQuestion No : 20

Q.20 गुप्त साम्राज्य के पतन के साथ ही राजनीति का केंद्र बन गया:

- Ans A. प्रयाग
 B. मगध
 C. दिल्ली
 D. कन्नौज

Question ID : 1841222584

Q.1 An electromagnet of resistance 12 ohm requires a current of 1.5 A to operate it. Find the required voltage.

- Ans
- A. 12 V
 - B. 18 V
 - C. 8 V
 - D. 27 V

Question ID : 1841222603

Q.2 The first term of a geometric progression is 1. The sum of the third and fifth terms is 90. The common ratio of the geometric progression is :

- Ans
- A. 2
 - B. 9
 - C. 3
 - D. $\frac{1}{3}$

Question ID : 1841222592

Q.3 The co-factor of the element s in the determinant A given is :

$$A = \begin{vmatrix} m & n & o \\ p & q & r \\ s & t & u \end{vmatrix}$$

- Ans
- A. $(-)\begin{vmatrix} n & o \\ q & r \end{vmatrix}$
 - B. $\begin{vmatrix} m & n \\ p & q \end{vmatrix}$
 - C. $(-)\begin{vmatrix} q & r \\ t & u \end{vmatrix}$
 - D. $\begin{vmatrix} n & o \\ q & r \end{vmatrix}$

Question ID : 1841222593

Q.4 Calculate the molality of 3 gram of ethanoic acid (CH_3COOH) in 100 gram of benzene. (Take atomic weights of elements as : C = 12, O = 16, H = 1)

- Ans
- A. 0.5 mol/kg
 - B. 0.05 mol/kg
 - C. 0.33 mol/kg
 - D. 0.67 mol/kg

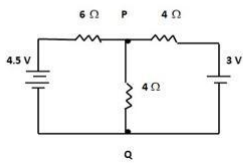
Question ID : 1841222590

Q.5 For a Spur gear system, the driver gear has 24 teeth and the driven gear has 72 teeth. Determine the velocity ratio.

- Ans**
- A. $\frac{1}{9}$
 - B. $\frac{1}{3}$
 - C. $\frac{1}{\sqrt{3}}$
 - D. 3

Question ID : 1841222605

Q.6 Making use of Tevenin's theorem, estimate the current in $4\ \Omega$ resistor between terminals P and Q as shown in Figure. Assume the internal resistance of batteries as zero.



- Ans**
- A. $\frac{2}{3}$ A
 - B. $\frac{3}{8}$ A
 - C. $\frac{7}{16}$ A
 - D. $\frac{9}{16}$ A

Question ID : 1841222604

Q.7 Among the six material given, identify the materials whose thermal conductivity can be measured using Searle's method.

Materials : Natural rubber, Teflon, Silver, Glass, Wood, Copper

- Ans**
- A. Silver, Copper
 - B. Teflon, Glass
 - C. Natural rubber, Teflon
 - D. Glass, Wood

Question ID : 1841222589

Q.8 The co-efficient of friction between the road surface and the tyre of an automobile is μ . At what speed v , the automobile can travel safely without skidding around a curve of radius r . Take m as mass of automobile and g as acceleration due to gravity.

Ans

A. $v = \sqrt{\frac{m g}{\mu r}}$

B. $v = \sqrt{\mu g r}$

C. $v = \mu g r$

D. $v = \sqrt{\frac{\mu r}{m g}}$

Question ID : 1841222600

Q.9 Consider the motion of a point on a circular trajectory. The velocity in a linear motion (v) and the velocity in angular motion (ω), are related as : (Take r as the radius of circular trajectory)

Ans

A. $v = \frac{\omega}{r}$

B. $v = r \omega$

C. $v = 2r \omega$

D. $v = r^2 \omega$

Question ID : 1841222599

Q.10 The following statements (S1 and S2) pertain to principle of moments stated as Varignon theorem :

S1 : Theorem states that the Square of the moment of a Force is equal to the Sum of the Square moment of its components.

S2 : For applying Varignon Theorem, the force system may be either coplanar or spatial, but it must be concurrent.

Identify the statements as True or False and choose the best answer.

Ans

A. Both S1 and S2 are False

B. Both S1 and S2 are True

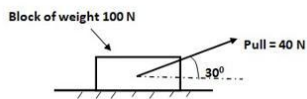
C. S1 is True and S2 is False

D. S1 is False and S2 is True

Question ID : 1841222596

Q.11 A body of weight 100 N is placed on a rough horizontal plane as in Figure, requires a pull of 40 N inclined at 30 degrees to the horizontal, just to move it. Determine the co-efficient of friction between the block and horizontal plane. (take $\cos 30 = \frac{\sqrt{3}}{2}$; $\sin 30 = 0.5$)

$$30 = \frac{\sqrt{3}}{2}; \sin 30 = 0.5$$



Ans

A. $\frac{1}{3}$

B. $\frac{\sqrt{3}}{6}$

C. $\frac{\sqrt{3}}{8}$

D. $\frac{\sqrt{3}}{4}$

Question ID : 1841222602

Q.12 The following statements (S1, S2) pertain to the transpose of matrices.

S1 : The transpose of the transpose of a matrix B coincides with itself i.e., $(B^T)^T = B$.

S2 : The transpose of a symmetric matrix A, $A^T = (-)A$.

Check the validity of statements as True or False and select the best option.

Ans

A. S1 is True and S2 is False

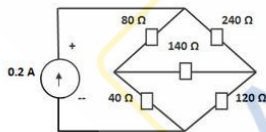
B. S1 is False and S2 is True

C. Both S1 and S2 are False

D. Both S1 and S2 are True

Question ID : 1841222594

Q.13 A Wheatstone bridge with resistors as shown in figure is connected to a 0.2 A current source. Find the voltage across the 0.2 A current source, if the 140 Ω resistor is shorted.



Ans

A. 12 V

B. 48 V

C. 6 V

D. 18 V

Question ID : 1841222588

Q.14 The following statements (S1 and S2) pertain to Work and Energy associated with the motion of a body.

S1 :Work done by a force may be positive or negative depending upon whether the force component is directed along or opposite to the direction of displacement.

S2 : Units of Work done and Energy are different .

Choose the correct option.

- Ans**
- A. S1 is True and S2 is False
 - B. Both S1 and S2 are False
 - C. Both S1 and S2 are True
 - D. S1 is False and S2 is True

Question ID : 1841222601

Q.15 According to Coloumb's law, the magnitude of the electrical force F between two charged particles separated by a distance r and having charges q_1 and q_2 , is expressed as : (k is the electrostatic constant)

- Ans**
- A. $F = \left(\frac{k}{r^2}\right) \frac{q_1}{q_2}$
 - B. $F = k \cdot \frac{q_1 \cdot q_2}{r}$
 - C. $F = k \cdot \frac{q_1 \cdot q_2}{r^2}$
 - D. $F = k \cdot \frac{r^2}{q_1 \cdot q_2}$

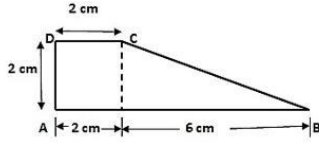
Question ID : 1841222587

Q.16 The inner and outer radii of a single plate clutch are 40 mm and 80 mm respectively. Determine the average pressure (in kN/m^2 units) when the axial force is 3 kN.

- Ans**
- A. $\frac{30000}{64 \pi}$
 - B. $\frac{10000}{8 \pi}$
 - C. $\frac{3000}{4 \pi}$
 - D. $\frac{10000}{16 \pi}$

Question ID : 1841222606

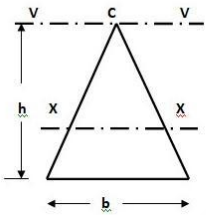
Q.17 The figure shows a plane lamina ABCD and consist of a rectangular area and triangular area. Find the distance to centroid of the section shown in figure from the side AD in the horizontal direction (parallel to side AB).



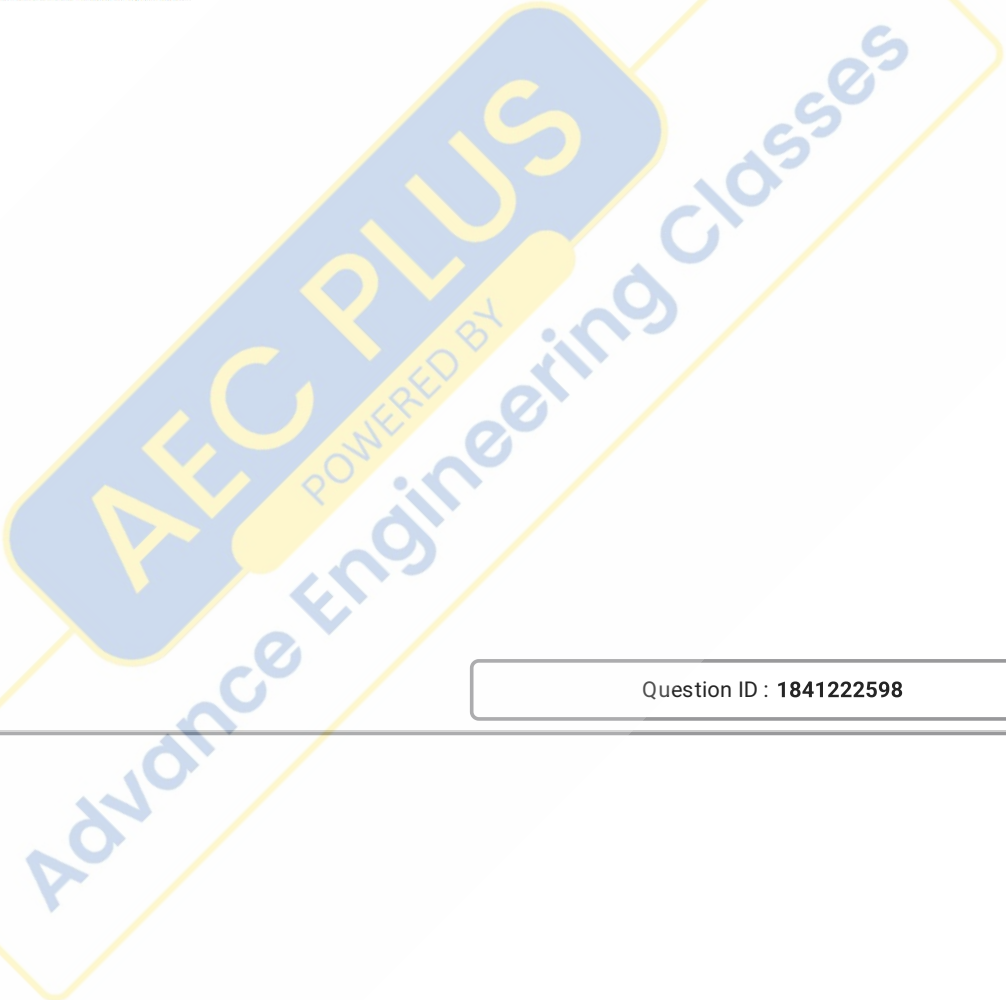
- Ans
- A. 2.4 cm
 - B. 3 cm
 - C. 2.8 cm
 - D. 1.8 cm

Question ID : 1841222597

Q.18 Find the Moment of inertia of the triangular lamina of base b and height h as shown in figure, about the line VV passing through vertex C and parallel to the centroidal axis XX.

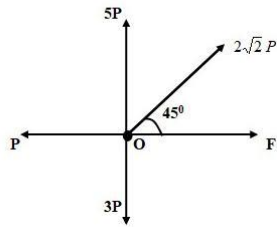


- Ans
- A. $\frac{bh^3}{4}$
 - B. $\frac{bh^3}{3}$
 - C. $\frac{bh^3}{12}$
 - D. $\frac{7bh^3}{12}$



Question ID : 1841222598

Q.19 Find the magnitude of the unknown force **F**, if the resultant of the four forces (**F**, **P**, **3P**, and **5P**) acting at the point **O** is $2\sqrt{2}P$ as shown in figure. The four concurrent forces (**3P** and **5P** act in vertical directions; **P** and **F** in Horizontal directions) acting at a point **O** as shown in Figure.



- Ans**
- A. $3P$ (\rightarrow)
 - B. $5P$ (\rightarrow)
 - C. $2P$ (\rightarrow)
 - D. $4P$ (\rightarrow)

Question ID : 1841222595

Q.20 According to IS 10500 : 2012, the acceptable limit of total hardness (as CaCO_3) in drinking water, shall not exceed :

- Ans**
- A. 200 mg/l
 - B. 500 mg/l
 - C. 250 mg/l
 - D. 2000 mg/l

Question ID : 1841222591

Section : Discipline 2

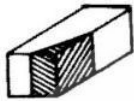
Q.1 Match the items under List 1 (Terms associated with transporting and placing of concrete) with those under List 2 (definition of the phenomena). Use codes in lists for matching.

List 1	List 2
P. Mobility	1. Firmness of concrete or ease with which it flows
Q. Bleeding	2. Separation of the constituents of a homogeneous mixture of concrete
R. Segregation	3. Ability to be moulded
S. Consistency	4. Water gain

- Ans**
- A. P – 1, Q- 4, R- 3, S- 2
 - B. P – 2, Q- 4, R- 1, S- 2
 - C. P – 4, Q- 3, R- 1, S- 2
 - D. P – 3, Q- 4, R- 2, S- 1

Question ID : 1841222624

Q.2 When a brick is cut at one end by half header and half stretcher, as shown in Figure, it is known as:



- Ans**
- A. Cant
 - B. King Closer
 - C. Queen Closer
 - D. Bull nosed

Question ID : 1841222610

Q.3 The dimensionless number that is made use of in the classification of flow through a pipe as laminar flow or turbulent flow is :

- Ans**
- A. Reynolds Number
 - B. Froude Number
 - C. Webber Number
 - D. Strouhal Number

Question ID : 1841222621

Q.4 The following statements S1 and S2 pertain to Underpinning and Shoring used in building construction.

S1 : Among the basic systems of shoring, Dead Shoring is used to support a combination of vertical and horizontal loadings.

S2: Underpinning work is done to transfer the load carried by a foundation from its existing bearing level to a new level at a lower depth.

Identify the statements as True or False and choose the correct answer option .

- Ans**
- A. Both S1 and S2 are False
 - B. S1 is True and S2 is False
 - C. Both S1 and S2 are True
 - D. S1 is False and S2 is True

Question ID : 1841222611

Q.5 According to Indian Standard Specification, which type of occupancy have the requirement that the open spaces around the building should be not less than 4.5 m. Assume the building is not in a residential zone area.

- Ans**
- A. Business or Mercantile buildings
 - B. Educational buildings : Schools or Colleges
 - C. Institutional buildings
 - D. Assembly buildings

Question ID : 1841222608

Q.6 The following statements (S1, S2 and S3) pertain to Louvered Doors:

S1 : Louvers in the door are arranged at such an inclination that horizontal vision is obstructed.

S2 : Use of this type of doors donot envisage privacy and prevent natural ventilation.

S3 : They harbour dust and are difficult to clean.

Identify the correct statement(s).

- Ans**
- A. S2 only
 - B. S2 and S3 only
 - C. S1 and S2 only
 - D. S1 and S3 only

Question ID : 1841222613

Q.7 The gauge pressure reading at a point in a pipe line is 50 kN/m^2 . Express the pressure as absolute pressure, if the atmospheric pressure at the locality is 100 kN/m^2 .

- Ans**
- A. 2 kN/m^2
 - B. 150 kN/m^2
 - C. 50 kN/m^2
 - D. 15 kN/m^2

Question ID : 1841222620

Q.8 A confined aquifer having water under a piezometric head of H is subjected to a constant steady rate of pumping by a well which fully penetrates the aquifer. The constant draw down in the pumping well is S_p . The piezometric head and drawdown s_R values observed at the radius of influence of the pumping well for the aquifer in the case is :

- Ans**
- A. Piezometric head = $0.5 H + S_p$; $s_R = \text{Zero}$
 - B. Piezometric head = $H - S_p$; $s_R = S_p$
 - C. Piezometric head = $H - S_p$; $s_R = \text{Zero}$
 - D. Piezometric head = H ; $s_R = \text{Zero}$

Question ID : 1841222618

Q.9 As per IS : 1904-1986, identify the type of foundation that doesnot come under the class of Shallow foundation.

- Ans**
- A. Raft Foundation
 - B. Strip footing foundation
 - C. Caissons
 - D. Ring and Shell foundation

Question ID : 1841222609

Q.10 Three statements (S1, S2 and S3) associated with light weight concrete are given.

S1 : Resistance to freezing and thawing is greater due to greater porosity of light weight aggregate.

S2 : For the same strength, the deflections are lesser in light weight concrete, compared to normal concrete.

S3 : Fire resistance is greater because light weight aggregates have a lesser tendency to spall.

Choose the correct statement(s)

- Ans**
- A. S2 and S3 only
 - B. S1 and S3 only
 - C. S1 and S2 only
 - D. S2 only

Question ID : 1841222626

Q.11 Intrados of an arch represents :

Ans A. Inner Curve of the arch

B. Upper or External Curve of an arch

C.

Lower half portion of arch between the crown and the springer

D.

Imaginary horizontal line joining two springing points of an arch

Question ID : 1841222612

Q.12 The following statements (S1 and S2) pertain to a worm gear.

S1 : Lead angle of the worm is equal to the helix angle of the gear wheel

S2 : Axial pitch of worm is greater than the circular pitch of gear wheel.

Check the statements as True/False and choose the correct option.

Ans A. S1 is True and S2 is False

B. Both S1 and S2 are True

C. Both S1 and S2 are False

D. S1 is False and S2 is True

Question ID : 1841222607

Q.13 The type of aquifer in which the water table serves as the upper surface of the zone of saturation is known as :

Ans A. Artesian aquifer

B. Phreatic aquifer

C. Leaky aquifer

D. Confined aquifer

Question ID : 1841222617

Q.14 Choose the Incorrect option with respect to Sulphate attack on Concrete.

Ans A.

Magnesium Sulphate has less damaging effect than other sulphates present.

B.

The vulnerability of concrete to Sulphate attack can be reduced by the use of cement having low percentage of Tricalcium aluminate

C.

Improved resistance to sulphate attack can be achieved by the use of Portland Pozzolana cement .

D.

Concrete attacked by Sulphates has a whitish appearance, with start of damage at the edges and corners, followed by cracking and spalling of concrete.

Question ID : 1841222625

Q.15 Determine the specific weight of a liquid having a specific gravity of 0.8. Take density of water = 1000 kg/m^3 , acceleration due to gravity = 10 m/s^2 .

- Ans
- A. 8 kN/m^3
 - B. 0.8 kN/m^3
 - C. 1.25 kN/m^3
 - D. 12.5 kN/m^3

Question ID : 1841222619

Q.16 Which of the following is not a functional component of a Central Processing Unit of a computer ?

- Ans
- A. Arithmetic and Logic Unit
 - B. Memory Unit
 - C. Control Unit
 - D. Output device

Question ID : 1841222623

Q.17 Dickens formula is an empirical formula used for the estimation of the peak rate of runoff Q_p during flood from a catchment), and is related to the parameter :

- Ans
- A. length of longest drain
 - B. Drainage density
 - C. Depth of rainfall
 - D. Area of catchment

Question ID : 1841222616

Q.18 The following statements (S1, S2 and S3) pertain to Orifice meter used for flow measurement . Choose the correct statement(s).

S1 : Orifice meter is an equipment used for measuring the velocity of flow through open channel and pipe lines.

S2 : Practical application of Bernoulli's theorem is made use of in an Orifice meter.

S3 : Head loss in an orifice meter is very small when compared to a Venturimeter used for flow measurement.

- Ans
- A. S2 only
 - B. S1 and S3 only
 - C. S1 only
 - D. S3 only

Question ID : 1841222622

Q.19 Identify the type of scaffolding which is conform to the following statements.

1. When it is not possible to fix the standards into the ground in the usual manner in scaffolding.
2. Where Scaffolding is to be provided on the side of a busy street without obstructing the traffic on road.

Scaffolding is supported by a series of cantilevers passing through window openings or through holes in the wall.

- Ans**
- A. Trestle Scaffolding
 - B. Suspended scaffolding
 - C. Patented Scaffolding
 - D. Needle Scaffolding

Question ID : 1841222614

Q.20 The type of irrigation practice in which water is conveyed through a system of flexible pipe lines operating at low pressure, applied near the base of the plant, and has got the maximum saving of water is :

- Ans**
- A. Furrow method
 - B. Check flooding
 - C. Sprinkler Irrigation
 - D. Drip Irrigation

Question ID : 1841222615

Section : Discipline 3

Q.1 Euler's Crippling load for a column of length L with both ends fixed is given by : (Assume uniform flexural rigidity EI for the column Section)

- Ans**
- A. $\frac{\pi^2 EI}{L^2}$
 - B. $\frac{4\pi^2 EI}{L^2}$
 - C. $\frac{\pi^2 EI}{4L^2}$
 - D. $\frac{2\pi^2 EI}{L^2}$

Question ID : 1841222633

Q.2 According to IS 1172:1993, for the computation of daily water requirement for Hospitals (including laundry) with number of beds not exceeding 100, the percapita water requirement is to be take as :

- Ans**
- A. 340 litre per head/day
 - B. 450 litre per head/day
 - C. 135 litre per head/day
 - D. 250 litre per head/day

Question ID : 1841222635

Q.3 As per IS 712 -1984, the lime used for making masonry mortar, lime concrete and plaster undercoat is :

- Ans**
- A. Class C – Fat lime
 - B. Class D – Magnesum/Dolomitic lime
 - C. Class B – Semi- hydraulic lime
 - D. Class F – Silicious Dolomitic lime

Question ID : 1841222646

Q.4 A simply supported beam AB (span 4 m) with supports at the ends A and B, is subjected to a uniformly distributed load of 4 kN/m throught the span AB. Determine the the maximum bending stress developed in the beam cross section. The cross section of beam is rectangular with width = 120 mm and depth = 200 mm, and the beam is placed with depth 200 mm in vertical direction. Assume E as the modulus of elasticity of material of beam.

- Ans**
- A. 10 N/mm²
 - B. 320 N/mm²
 - C. 40 N/mm²
 - D. 160 N/mm²

Question ID : 1841222629

Q.5 Which of the following is not a disinfection method of water ?

- Ans**
- A. UV radiation
 - B. Ion exchange
 - C. Boiling
 - D. Ozonation

Question ID : 1841222640

Q.6 Estimate the power transmitted (in kW units) by a solid circular shaft of diameter 20 mm at 120 rpm if the shear stress on the material must not exceed 100 N/mm².

- Ans**
- A. $0.5 \pi^2$
 - B. π^2
 - C. $0.2 \pi^2$
 - D. $0.4 \pi^2$

Question ID : 1841222632

Q.7 Which one among the following is not used as a coagulant in water treatment ?

- Ans**
- A. Sodium Chloride
 - B. Cationic Polymers
 - C. Ferric Sulphate
 - D. Sodium aluminate

Question ID : 1841222638

Q.8 The following statements (S1 and S2) pertain to Filtration process for water treatment.

S1 : The mechanisms of filtration involve Straining, Sedimentation on media, and Adsorption.

S2 : When the filter is clean, the head loss gauge should indicate a zero reading.

Check the validity of the statements as True or False and choose the best answer.

- Ans**
- A. S1 is False and S2 is True
 - B. Both S1 and S2 are True
 - C. S1 is True and S2 is False
 - D. Both S1 and S2 are False

Question ID : 1841222639

Q.9 A rapid test to assess the pollution status of a water body is :

- Ans**
- A. MPN
 - B. Biochemical Oxygen demand (BOD)
 - C. Dissolved Oxygen
 - D. Turbidity

Question ID : 1841222642

Q.10 As per IS 10500 : 2012, in drinking water, the permissible limits of Total hardness (as CaCO_3) in the absence of alternate source is :

- Ans**
- A. 600 mg/l
 - B. 1000 mg/l
 - C. 400 mg/l
 - D. 200 mg/l

Question ID : 1841222637

Q.11 According to IS 1077 : 1992, the standard modular size of common burnt clay building bricks is :

- Ans**
- A. 190 mm x 90 mm X 70 mm
 - B. 190 mm x 90 mm X 40 mm
 - C. 190 mm x 80 mm X 80 mm
 - D. 230 mm x 110 mm X 70 mm

Question ID : 1841222644

Q.12 The poisson ratio of a ductile material is 0.25. The relationship between the elastic modulus (E) and shear modulus (N) of this material is :

- Ans**
- A. $E = 3 N$
 - B. $E = 2.5 N$
 - C. $N = 1.25 E$
 - D. $N = 2.5 E$

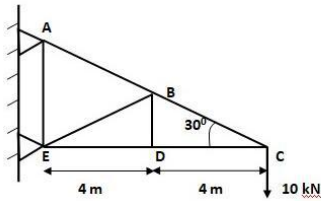
Question ID : 1841222628

Q.13 The following beam sections are subjected to bending with load acting from the top. (i) Rectangular beam (width $b = 200$ mm and depth $d = 400$ mm) with load acting on top face of width b (ii) a symmetrical I section (flange 250 mm X 20 mm, and web 460 mm X 20 mm) with flange on top and load acting on the flange face. The intensity of shear stress due to bending will be maximum for the sections as :

- Ans**
- A.
At a distance of $0.5 d$ from the top face for the rectangular beam ; at a point on the web (at a distance of 250 mm from the flange top) for the I section
 - B.
At the top face ($d=0$) for the rectangular beam ; at top face of flange for the I section
 - C.
At a distance of $0.25 d$ from the top face for the rectangular beam ; at the junction of the web and bottom flange (at a distance of 20 mm above the bottom face of flange) for the I section
 - D.
At a distance of $0.5 d$ from the top face for the rectangular beam ; at the junction of the web and the top flange (at a distance of 20 mm below the flange top) for the I section

Question ID : 1841222630

Q.14 For the truss shown in Figure (supports A & E are hinge type, angle BCD = 30 degree) the forces in members BD and CD are respectively (in KN units).



- Ans
- A. 20 (ten.) ; Zero
 - B. 10 (ten.) ; $10\sqrt{3}$ (comp)
 - C. Zero ; 5 (comp.)
 - D. Zero ; $10\sqrt{3}$ (comp.)

Question ID : 1841222634

Q.15 According to IS 1742: 1983, in the design of gravity drains for building drainage under ruling gradient, the minimum self cleansing velocity and the maximum velocity of flow to be adopted are respectively :

- Ans
- A. 0.3 m/s and 1.5 m/s
 - B. 1.0 m/s and 3.8 m/s
 - C. 0.75 m/s and 2.4 m/s
 - D. 0.5 m/s and 3.2 m/s

Question ID : 1841222641

Q.16 Match the items under List 1 (Composition of Cement Clinker) with those under List 2 (Name of Bogue Compound) in the manufacture of Ordinary Portland cement. Use Codes for matching.

List 1	List 2
P. Tricalcium silicate	1. Celite
Q. Dicalcium Silicate	2. Felite
R. Tricalcium aluminate	3. Belite
S. Tetracalcium alumino ferrite	4. Alite

- Ans
- A. P - 4, Q - 3, R - 1, S - 2
 - B. P - 2, Q - 3, R - 1, S - 4
 - C. P - 3, Q - 1, R - 4, S - 2
 - D. P - 3, Q - 4, R - 2, S - 1

Question ID : 1841222645

Q.17 Based on geological classification, six rock types are given below. Identify the rock types which do not fall under the category of Metamorphic rocks.

Rock types : Schist, Slate, Basalt, Marble, Gneiss, Quartzite, Limestone

- Ans
- A. Schist, Slate
 - B. Marble, Quartzite
 - C. Schist, Gneiss
 - D. Basalt, Limestone

Question ID : 1841222643

Q.18 Identify the commonly used accelerator type admixture in concrete work.

- Ans
- A. Sugar
 - B. Soluble zinc salts
 - C. Carbohydrate derivatives
 - D. Calcium Chloride

Question ID : 1841222627

Q.19 Which of the following is not a type of river intake for drawing water ?

- Ans
- A. Intake wells
 - B. Canal Intakes
 - C. Weir Intakes
 - D. Pipe Intakes

Question ID : 1841222636

Q.20 A circular column having diameter D has to support a non-axial load W acting at an eccentricity of e from the centre of column. Find the value of e so that no tension is developed in the section of the column.

- Ans
- A. $\frac{D}{4}$
 - B. $\frac{D}{8}$
 - C. $\frac{D}{16}$
 - D. $\frac{D}{3}$

Question ID : 1841222631

Q.1 The following statements (S1 and S2) pertain to Kiln Seasoning of Timber.

S1 : It is a slow process of seasoning timber to the desired moisture content.

S2 : Lack of an efficient humidifying arrangement exposes the timber to increased degrade through cracking and splitting, as also makes case hardening relief impossible particularly in refractory timbers.

Check for the validity of statements as True or False and choose the best answer option.

- Ans**
- A. Both S1 and S2 are False
 - B. S1 is False and S2 is True
 - C. S1 is True and S2 is False
 - D. Both S1 and S2 are True

Question ID : 1841222647

Q.2 A sample of dry cohesionless soil was tested in a triaxial machine. If the angle of shearing resistance was 30 degree, and the confining pressure 100 kN/m^2 , determine the deviator stress (in kN/m^2 units) at which the sample failed.

- Ans**
- A. 250
 - B. 200
 - C. 300
 - D. 100

Question ID : 1841222654

Q.3 The void ratio of a soil is 0.25. Determine the value of seepage velocity (v_s) through the soil if the discharge velocity is $3 \times 10^{-4} \text{ mm/s}$.

- Ans**
- A. $6 \times 10^{-4} \text{ mm/s}$
 - B. $15 \times 10^{-4} \text{ mm/s}$
 - C. $0.6 \times 10^{-4} \text{ mm/s}$
 - D. $12 \times 10^{-4} \text{ mm/s}$

Question ID : 1841222652

Q.4 A three hinged segmental arch has a span of 40 m and rise of 5 m, have supports A and B at the same level. It is subjected to a vertical point load of 80 kN acting at 10 m from the right support B. Determine the vertical reaction (V_B) and horizontal thrust (H_B) at the right support B.

- Ans**
- A. $V_B = 20 \text{ kN}$ and $H_B = 60 \text{ kN}$
 - B. $V_B = 60 \text{ kN}$ and $H_B = 80 \text{ kN}$
 - C. $V_B = 60 \text{ kN}$ and $H_B = 240 \text{ kN}$
 - D. $V_B = 20 \text{ kN}$ and $H_B = 100 \text{ kN}$

Question ID : 1841222660

Q.5 A separate class of highways provided with divided carriage ways, controlled access, grade separations at cross roads and fencing, permit only fast moving vehicles is categorized as :

- Ans**
- A. Special State Highways
 - B. Expressways
 - C. Arterial Roads
 - D. National Highways

Question ID : 1841222666

Q.6 A loose deposit of wind blown silt that has been weakly cemented with calcium carbonate and montmorillonite, formed in arid and semi-arid regions, the type of soil formation known as :

- Ans**
- A. Muck
 - B. Peat
 - C. Loess
 - D. Humus

Question ID : 1841222649

Q.7 According to IS 8969:1978, as a precautionary measure of safety, the minimum vertical clearance of any member of the crane with respect to a 110 kV overhead power line passing over the site shall be:

- Ans**
- A. 2.5 m
 - B. 5.5 m
 - C. 3.6 m
 - D. 4.7 m

Question ID : 1841222662

Q.8 Command used in AUTOCAD to separate a compound object to component elements

- Ans**
- A. BLOCK
 - B. BREAK
 - C. MOVE
 - D. EXPLODE

Question ID : 1841222665

Q.9 As per Indian Standard Soil Classification identify the soil type with the following details: Fine grained soil with more than 50 % passing through 75 micron IS sieve; Has liquid limit value greater than 60% Plasticity index value greater than 40 % ; Atterberg limit plots above the A-line.

- Ans**
- A. CH
 - B. CL
 - C. OI
 - D. MH

Question ID : 1841222651

Q.10 Determine the maximum bending moment at a section 3 m from the left support of a simply supported beam AB (left end support A is a hinge, and the right end support is a roller) of span 5 m. A single vertical point load of 100 kN rolls across the beam.

- Ans
- A. 125 kNm
 - B. 120 kNm
 - C. 40 kNm
 - D. 60 kNm

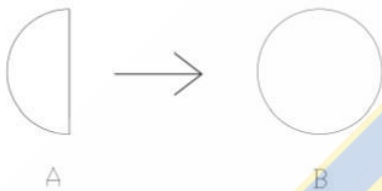
Question ID : 1841222661

Q.11 A beam AB is hinged at the end B and fixed at end A. A clockwise moment M is applied at the end B. What is the carry over factor to be used in Moment distribution method in the determination of moment at the support A?

- Ans
- A. 0.333
 - B. 1.0
 - C. 0.25
 - D. 0.5

Question ID : 1841222659

Q.12 Which command in AUTOCAD, can be used to create Object B from Object A as shown in Figure.



- Ans
- A. MOVE
 - B. MIRROR
 - C. COPY
 - D. ROTATE

Question ID : 1841222664

Q.13 The deviation of a first point on the elastic curve of a beam measured perpendicular to the original position of the beam, from the tangent drawn to the same curve from a second point is equal to :

- Ans
- A. Square of the moment of the area of the moment diagram between the above twopoints about the first point divided by EI of beam
 - B. Moment of the area of the moment diagram between the above twopoints about the first point divided by EI of beam
 - C. Square of the area of the moment diagram between the two points divided by the EI of beam
 - D. Area of the moment diagram between the two points divided by the EI of beam

Question ID : 1841222655

Q.14 The statements (S1, S2, S3, S4) pertain to the professional involvement/actions of engineers in a construction industry. According to Professional society norms on ethics, identify actions which is/are ethical.

S1 : Exaggerating experience and academic achievements in resumes and applications for commissions

S2 : Charging clients for work not done, costs not incurred or overstated

S3 : Impartial Involvement in conflict of interest to solve a problem.

S4 : Accepts Gifts from suppliers of Items, and not from Clients.

- Ans**
- A. S2 and S4
 - B. S1 and S3
 - C. S3 only
 - D. S1 and S4

Question ID : 1841222663

Q.15 The following statements are associated with the Compression index of soils. Choose the **incorrect** statement.

- Ans**
- A. Value of compression index is not a constant for a given soil and is a function of the effective stress.
 - B. Value of compression index is a constant for a given soil and is not a function of the effective stress.
 - C. Higher the compression index value, larger the resulting vertical deformation in a clay soil.
 - D. Compression index is a meaningful parameter only for Normally consolidated soils.

Question ID : 1841222653

Q.16 Match the items under List 1 (Constituent of Oil paint) with those under List 2 (Name of materials used form the constituent). Use Codes for matching.

List 1	List 2
P. Base	1. Titanium dioxide
Q. Vehicle	2. Turpentine Oil
R. Solvent	3. Zinc White
S. Pigment	4. Linseed Oil

- Ans**
- A. P- 4, Q - 3, R- 1, S - 2
 - B. P- 3, Q - 4, R- 2, S - 1
 - C. P- 2, Q - 3, R- 4, S - 1
 - D. P- 3, Q - 1, R- 4, S - 2

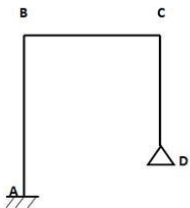
Question ID : 1841222648

Q.17 The void ratio of a partially saturated soil sample is 0.5. Determine the porosity of soil sample.

- Ans
- A. $\frac{1}{3}$
 - B. $\frac{1}{6}$
 - C. 1
 - D. $\frac{2}{3}$

Question ID : 1841222650

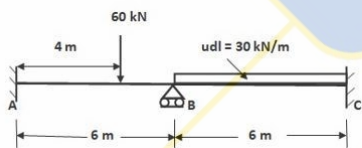
Q.18 The degree of freedom (or kinematically indeterminate) of the single bay portal frame ABCD (support A is fixed type, support D is a hinge ; joints B and C are pin jointed type) is :



- Ans
- A. 9
 - B. 4
 - C. 7
 - D. 5

Question ID : 1841222656

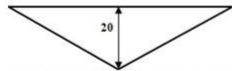
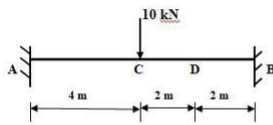
Q.19 A two span continuous beam with loadings as shown in Figure, with supports A and C as fixed and support B as roller. Assume Young's modulus of material and moment of inertia of sections as constant throughout. The slope deflection equations formulated for the span AB are : (Notations : M indicates moment and θ indicates the slope at the respective points)



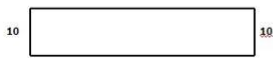
- Ans
- A. $M_{AB} = \frac{1}{3} EI \theta_B + EI \theta_A - \frac{160}{3}$; $M_{BA} = \frac{2EI}{3} \theta_B + EI \theta_A + \frac{80}{3}$
 - B. $M_{AB} = \frac{1}{3} EI \theta_B - \frac{80}{3}$; $M_{BA} = \frac{2EI}{3} \theta_B + \frac{160}{3}$
 - C. $M_{AB} = \frac{1}{3} EI \theta_A + \frac{80}{3}$; $M_{BA} = \frac{2EI}{3} \theta_B + \frac{160}{3}$
 - D. $M_{AB} = \frac{2}{3} EI \theta_B - \frac{80}{3}$; $M_{BA} = \frac{1}{3} EI \theta_B + \frac{160}{3}$

Question ID : 1841222658

Q.20 Find the deflection at the point D (at a distance of $0.25 L$ from the right end B) for a fixed beam AB, subjected to a central concentrated load 10 kN at C as in Figure. The Bending moment diagram of the simply supported beam and the fixed end moment diagram of the beam AB are also given in figure. Use Area moment theorem. Beam has uniform EI values.



Simply Supported Bending Moment Diagram



Fixed End Moment Diagram

Ans

- A. $\frac{64}{3EI}$
- B. $\frac{80}{3EI}$
- C. $\frac{20}{3EI}$
- D. $\frac{40}{3EI}$

Question ID : 1841222657

Section : Discipline 5

Q.1 The following statements (S1, and S2) pertain to Overtaking sight distance(OSD) in highways

S1 : OSD depends on the speeds of overtaking vehicle, overtaken vehicle, and vehicle coming from opposite direction.

S2 : OSD requirement decreases on road stretches with descending gradient (gradient value greater than ruling gradient in plain terrain)

Assess the statements as True or False and choose the best option.

- Ans
- A. S1 is False and S2 is True.
 - B. S1 is True and S2 is False
 - C. Both S1 and S2 are True
 - D. Both S1 and S2 are False

Question ID : 1841222667

Q.2 Which one of the following does not form the constituents of a point or switch in a railway track.

- Ans
- A. Heel blocks
 - B. Point rail and Splice rail
 - C. Slide chairs
 - D. Stock rail and tongue rail

Question ID : 1841222671

Q.3 Determine the strength (in kN units) of a 20 mm diameter ordinary turned bolt used to connect two plates each 10 mm thick. Take permissible shear stress in bolt as 100 N/mm^2 and the allowable bearing stress as 300 N/mm^2 .

- Ans**
- A. 60
 - B. 30 kN
 - C. 10π
 - D. 20π

Question ID : 1841222675

Q.4 According to the railway board of India, New Delhi to Howrah (Rajdhani route) Broad gauge line comes under classification of Broad gauge routes of India having a maximum permissible speed of 160 km/h. Identify the classification to which it belongs to :

- Ans**
- A. Group B lines
 - B. Group D and D spl lines
 - C. Group A lines
 - D. Group C lines

Question ID : 1841222670

Q.5 A rolled ISHB 250 section (depth = 250 mm, width of flange = 250 mm, thickness of web = 8.8 mm, thickness of flange = 9.7 mm) is used as a compression member. Considering the buckling about Y-Y axis as per IS 800 : 2007, the corresponding buckling class to which the beam belongs to is:

- Ans**
- A. b
 - B. a
 - C. d
 - D. c

Question ID : 1841222679

Q.6 As per IRC 110 -2005, the water absorption limit of aggregates (except slag) tested as per IS 2386 (Part 3), used in surface dressing finishing course is :

- Ans**
- A. 1 %
 - B. 5 %
 - C. 10 %
 - D. 3 %

Question ID : 1841222668

Q.7 The following statements pertain to the Salvage value for a property.

S1 : Salvage value is the value of the dismantled materials of a property at the end of utility period, and can be sold as scrap.

S2 : Salvage value doesnot include the cost of removal of property and/or its sale.

Check for the validity of statements as True or False and choose the best answer option.

- Ans**
- A. S1 is False and S2 is True
 - B. S1 is True and S2 is False
 - C. Both S1 and S2 are True
 - D. Both S1 and S2 are False

Question ID : 1841222685

Q.8 Rolled steel section designated as ISA 40 X 25 X 6 indicate :

- Ans**
- A. T- section with width of flange 40 cm, depth of web 25 cm and thickness of web and flange as 6 mm
 - B. Unequal angle section with legs 40 cm and 25 cm in length and thickness of the legs 6 cm
 - C. Unequal angle section with legs 40 mm and 25 mm in length and thickness of the legs 6 mm
 - D. Channel section with depth of section 40 cm, width of flange 25 cm and thickness of web and flange 6 mm

Question ID : 1841222674

Q.9 As per IS 800: 2007, the maximum value of effective slenderness ratio for members always under tension (other than pre-tensioned members) is:

- Ans**
- A. 350
 - B. 180
 - C. 400
 - D. 300

Question ID : 1841222676

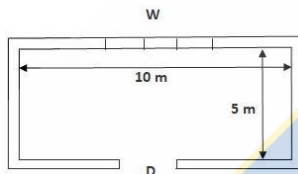
Q.10 Match the following items under List 1 (Types of Estimate) with those under List 2 (Description of Estimate). Use Codes for matching items.

List 1	List 2
P. Abstract Estimate	1. When there are material deviations from the original proposed estimate
Q. Cubic rate estimate	2. Accurate estimate <u>on the basis of the</u> quantities of each item of work
R. Revised Estimate	3. Basis of necessity, utility, revenue etc. with the knowledge and cost of similar works.
S. Item rate estimate	4. Based on the length and breadth of buiding at the floor level , and height of building.

- Ans
- A. P - 3, Q - 4, R - 2, S - 1
 - B. P - 3, Q - 4, R - 1, S - 2
 - C. P - 4, Q - 3, R - 1, S - 2
 - D. P - 4, Q - 1, R - 2, S - 3

Question ID : 1841222680

Q.11 What is total centreline length for the plan of an office room with internal dimensions 10 m X 5m shown in Figure. Take the thickness of walls as 20 cm.



- Ans
- A. 30 m
 - B. 30.4 m
 - C. 31.6 m
 - D. 30.8 m

Question ID : 1841222682

Q.12 The unit for the estimation of quantity for one of the works is different from the others. Identify the work.

- Ans
- A. Open Well Sinking (diameter specified)
 - B. Earth filling in plinth
 - C. Cement concrete
 - D. Course rubble masonry

Question ID : 1841222681

Q.13 According to IS 800:2007, the effective length of a prismatic compression member of unsupported length L , with the boundary end conditions as follows is :

At one end : Restrained against both translation and rotation.

At the other end : Free for translation and restrained against rotation.

- Ans**
- A. $1.2 L$
 - B. $2 L$
 - C. $0.8 L$
 - D. $0.65 L$

Question ID : 1841222678

Q.14 A trapezoidal canal of bottom width 6 m, depth 2 m, having a side slope of 2 : 1 (Horizontal : Vertical) is formed in cutting for a length of 1 km. The volume of earthwork to be excavated in forming the canal for the length 1 km is :

- Ans**
- A. 14600 m^3
 - B. 16000 m^3
 - C. 28000 m^3
 - D. 20000 m^3

Question ID : 1841222683

Q.15 Estimate the cost of construction of Reinforced Cement Concrete roof slab of dimensions 4 m X 2.5 m having a thickness 10 cm . Based on the market rates, the rate for carrying out the concrete work (without reinforcement) in the desired mix proportion including the materials and labour at the site along with form work is Rs. 10,000 per m^3 . The quantity of wet concrete shall be taken as 20 % more than the volume of concrete required for the slab. Requirement of reinforcement is @ 75 kg per m^3 of dry concrete. The cost of procurement of reinforcement (including the labour cost and placing in position) is Rs. 100 per kg of reinforcement. In addition, an extra 1 % of total cost is to be considered for water charges, and extra 10 % of total cost to be considered as Contractors profit.

- Ans**
- A. Rs. 23310
 - B. Rs. 21645
 - C. Rs. 19695
 - D. Rs. 21000

Question ID : 1841222684

Q.16 According to IS : 6509 - 1985, for reinforced concrete slabs of thickness 25 cm, with expansion joints and dummy contraction joints, the recommended maximum spacing of expansion (E) and contraction (C) joints are : (codes E and C used to indicate type of joints in answer options)

- Ans**
- A. E – 36 m ; C – 4 m
 - B. E – 30 m ; C – 7.5 m
 - C. E – 51 m ; C – 17 m
 - D. E – 27 m ; C – 4.5 m

Question ID : 1841222669

Q.17 As per IS 800 : 2007, the design strength of members under axial tension, T_{dg} , as governed by yielding of gross section, is given by : (Notations : f_y = yield stress of the material, A_g = gross area of cross-section, and γ_{m0} = partial safety factor for failure in tension by yielding)

Ans

A. $T_{dg} = \frac{A_g \cdot f_y}{\gamma_{m0}^2}$

B. $T_{dg} = \gamma_{m0} \cdot A_g \cdot f_y$

C. $T_{dg} = \frac{0.9 A_g \cdot f_y}{\gamma_{m0}}$

D. $T_{dg} = \frac{A_g \cdot f_y}{\gamma_{m0}}$

Question ID : 1841222677

Q.18 The amount which has to be set aside at fixed intervals of time, out of the gross income, so as to accumulate the initial value of the building at the end of the useful life of building is known as :

Ans

A. Replacement value

B. Reversionary value

C. Sinking fund

D. Salvage value

Question ID : 1841222686

Q.19 According to IS 800 : 2007, the modulus of elasticity of structural steel irrespective of its grade may be taken as:

Ans

A. 2×10^6 MPa

B. 2×10^7 MPa

C. 0.2×10^5 MPa

D. 2×10^5 MPa

Question ID : 1841222673

Q.20 It is necessary to construct a two lane road bridge across a river. Geophysical Investigation indicated soft clay for 12 m depth below the stream bed, followed by hard rock strata. The type of foundation not recommended for the site is :

Ans

A. Well Foundation

B. Caissons

C. Pile foundation

D. Raft foundation

Question ID : 1841222672