



SSC JE Civil Engineering 2013

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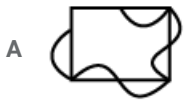
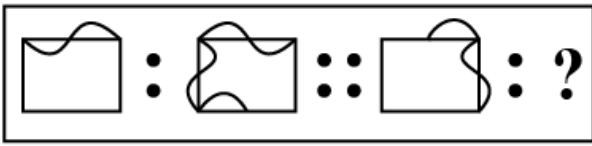
General Intelligence and Reasoning

Instructions

In the following questions, select the related figure/letters/number from the given alternatives.

Question 1

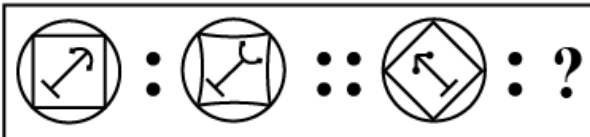
Question figures:



Answer: C

Question 2

Question figures:



Answer: C

Question 3

Question figures:



Answer: A

Question 4

23 : 8 :: 32 : ?

- A 6
- B 9
- C 17
- D 27

Answer: B

Question 5

MLKJ : NOPQ :: IHGF : ?

- A UTSR
- B RSTU
- C SRUT
- D UTRS

Answer: B

Question 6

ACEG : ZXVT :: BDFH : ?

A YWUS

B YXWV

C YWVT

D YXVW

Answer: A

Question 7

BADC : XWZY :: FEHG : ?

A VXRT

B TSVU

C YXCV

D VSXW

Answer: B

Question 8

$\frac{5}{9} : \frac{7}{13} :: \frac{10}{19} : ?$

A $\frac{14}{26}$

B $\frac{14}{27}$

C $\frac{14}{23}$

D $\frac{14}{25}$

Answer: B

Question 9

3 : 9 :: 6 : ?

A 14

B 18

C 17

D 16

Answer: B

Instructions

In the following questions, select the one which different from the other three responses.

Question 10

A 7 - 145

B 6 - 108

C 5 - 75

D 4 - 48

Answer: A

Question 11

A Mars

B Jupiter

C Earth

D Comet

Answer: D

Question 12

A Geeta

B Quran

C Bible

D Mahabharat

Answer: D

Question 13

A Message

B Information

C Matter

D Material

Answer: D

Question 14

A Guitar

B Veena

C Flute

D Sitar

Answer: C

Question 15

A 17 - 142

B 71 - 34

C 41 - 28

D 14 - 28

Answer: D

Question 16

- A 3, 5, 7, 9
- B 5, 7, 9, 11
- C 4, 6, 8, 10
- D 2, 5, 9, 10

Answer: D

Question 17

- A 8662
- B 5731
- C 4628
- D 2864

Answer: B

Question 18

- A Tagore
- B Raman
- C Bhaskara
- D Khurana

Answer: C

Instructions

For the following questions answer them individually

Question 19

Arrange the ee words Soeen order :

1. Grapes
2. Vineyard
3. Whisky
4. Brewing
5. Distillation

- A 2, 1, 5, 4, 3
- B 3, 5, 4, 2, 1
- C 2, 1, 4, 3, 5
- D 2, 1, 4, 5, 3

Answer: D

Question 20

Which will appear fourth in the dictionary ?

- A Xylophilous
- B Xylophagus
- C Xylopyrography
- D Xylophagan

Answer: C

Question 21

Number of letters skipped in between adjacent letters in the series increases by one. Which of the following series observes the rule given below?

- A BEIN
- B CDJO
- C GJLS
- D QUNZ

Answer: A

Question 22

In the following words, the group of letters should not contain more than three vowels. Which of the following words does not conform to the rule?

- A SCARCITY
- B PROGNOSIS
- C COMPLEXITY
- D CONVULSION

Answer: D

Instructions

In the following questions, choose the correct alternative from the given responses that will complete the series.

Question 23

?, PSV, EHK, TWZ, ILO

- A BEH
- B IMP
- C ACG
- D ADG

Answer: D

Question 24

78, 86, ?, 88, 82, 90

- A 76

B 84

C 83

D 80

Answer: D

Question 25

3 7 13 ? 31 43 57

A 51

B 81

C 41

D 21

Answer: D

Question 26

EJOT, INSX, AFKP, ?

A CHMS

B XTOJ

C BGLQ

D EJOT

Answer: C

Instructions

For the following questions answer them individually

Question 27

My father has two brothers. The youngest has two sons and one daughter. The elder one has one son and two daughters and the remaining one has three sons. If my father has four nephews, how many cousins (brothers) have I got ?

A 6

B 4

C 7

D 5

Answer: B

Question 28

Find the wrong number in the given series.

3, 7, 15, 31, 64, 127

A 127

B 64

C 31

D 3

Answer: B

Question 29

A car covers the first half of the distance between two places at 40 km/hr and the second half of the distance at 60 km/hr. So what is the average speed of the car?

A 46 km/hr

B 48 km/hr

C 50 km/hr

D 60 km/hr

Answer: B

Question 30

In a certain code language, TOGETHER is written as EGTORETH. How is CONGRATULATE written in that language ?

A GRTULTEANOC

B GNCOUTRAETLA

C GNOCUTARETAL

D GLNAOTCEURTA

Answer: B

Question 31

In certain code language, REQUEST is written as S2H52TU. How is RETEST written in that language?

A S2V2RV

B S2U2RU

C S2U2TU

D S2V2TV

Answer: C

Question 32

Some equations are solved on the basis of a certain system. On the same basis, find out the correct answer for the unsolved equation.

If $4^2 = 7$, $5^2 = 7$, $6^2 = 9$, then $7^2 = ?$

A 14

B 13

C 10

D 8

Answer: B

Question 33

Find out the number which belongs to the given group of numbers from the alternatives:
246, 579, 135, 35, 68

- A 55
- B 468
- C 123
- D 31

Answer: B

Question 34

If P stands for \div , Q stands for \times , R stands for $+$, then
 $18 Q 12 P 4 R 5 = ?$

- A 59
- B 26
- C 11.7
- D 2.33

Answer: A

Question 35

From the given alternatives, select the word which cannot be formed using the letters of the given word.
ACCOMPANIED

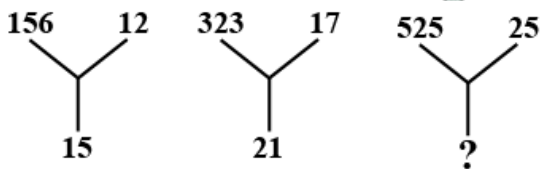
- A PANIC
- B COME
- C COMB
- D PAIN

Answer: C

Instructions

In the following questions, find the missing number from the given responses.

Question 36



- A 43
- B 17
- C 23
- D 87

Answer: C

Question 37

6	11	25
8	6	16
?	5	16

- A 10
- B 14
- C 12
- D 16

Answer: B

Instructions

For the following questions answer them individually

Question 38

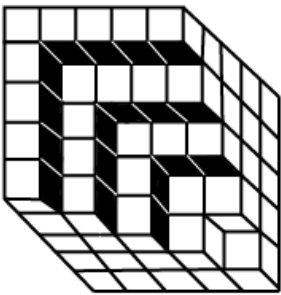
Ram travelled 6 ft towards West, he turned left and walked 8 ft, then turned left and walked 4 ft, then turned left and walked 8 ft again. How far is he now from the starting point ?

- A 8 ft
- B 6 ft
- C 4 ft
- D 2 ft

Answer: D

Question 39

How many black-faced cubes are there in the given structure ?



- A 75
- B 55
- C 25
- D 16

Answer: B

Question 40

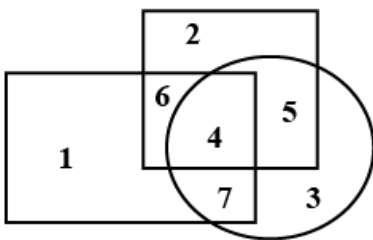
The door of Priya's house faces East. From the back side of the house, she walks straight 50 meters, then turns to the right and walks 50 meters again. Finally, she turns towards the left and stops after walking 25 meters. Now Priya is facing which direction ?

- A North
- B West
- C East
- D South

Answer: B

Question 41

In the following diagram, rectangle represents males, circle represents urban and square represents educated. Which region represents educated urban males?

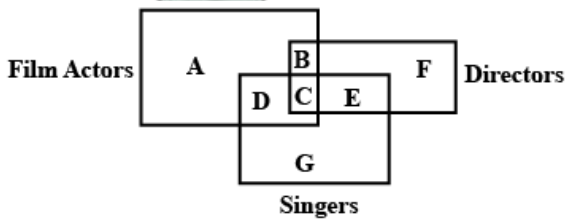


- A 5
- B 4
- C 6
- D 7

Answer: B

Question 42

In the following Venn diagram, identify the letter which denotes Film Actors who are Singers but not Directors.



- A D
- B C
- C E
- D F

Answer: A

Question 43

Identify the answer figure from which the pieces given in the question figure have been cut.

Question figure:



Answer: D

Instructions

In the following questions, one or two statements are given, followed by two conclusions I and II. You have to consider the statements to be true even if they seem to be at variance from commonly known facts, You have to decide which of the given conclusions, if any, follows from the given statements.

Question 44

Statement :

A social movement is an interaction of people with a common motivational base in frustration.

Conclusions :

I. In a social movement, people who are satisfied interact with frustrated people.

II. Frustrated people interact with each other in a social movement.

- A Only conclusion I follows
- B Only conclusion II follows
- C Neither conclusion I nor II follows
- D Both conclusions I and II follow

Answer: B

Question 45

Statements:

All scientists are hard-working. No hard-working man is poor.

Conclusions:

- I. No scientist is poor.
- II. No poor man is a scientist.

- A Only conclusion I follows
- B Only conclusion II follows
- C Both conclusions I and II follow
- D None of the conclusions I or II follows

Answer: C

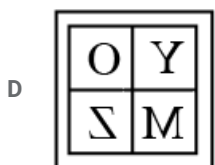
Instructions

For the following questions answer them individually

Question 46

Which of the answer figures is exactly the mirror image of the given figure, when the mirror is held on the line AB?

Question figure:



Answer: C

Question 47

A word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as in the two matrices given below. The columns and rows of Matrix I are numbered from 0 to 4 and that of Matrix II are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column, eg. 'A' can be represented by 13, 76, etc., and 'G' can be represented by 22, 65, etc. Similarly, you have to identify the set for the word 'PUBLIC'.

Matrix I

	0	1	2	3	4
0	A	U	O	T	B
1	T	E	P	A	W
2	R	M	G	G	I
3	U	M	M	C	L
4	P	L	N	E	C

Matrix II

	5	6	7	8	9
5	P	T	A	M	E
6	G	I	O	T	M
7	E	A	L	T	M
8	R	A	B	L	T
9	N	I	E	G	P

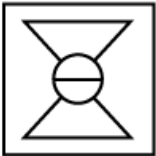
- A 12, 30, 87, 41, 66, 83
- B 99, 30, 87, 77, 23, 44
- C 55, 01, 87, 98, 34, 87
- D 40, 30, 87, 89, 24, 43

Answer: A

Question 48

Components of which of the answer figures will exactly make up the question figure given below.

Question figure:





Answer: D

Question 49

Select the answer figure in which the question figure is hidden/embedded

Question figure:

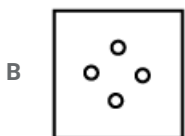
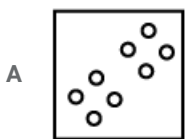
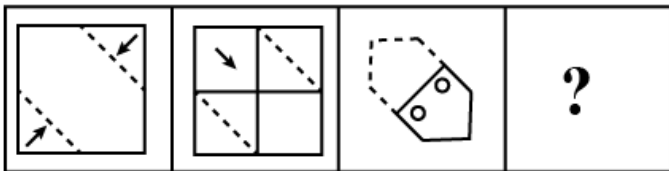


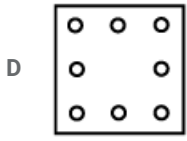
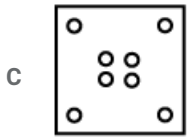
Answer: B

Question 50

A piece of paper is folded and punched as shown below in the question figure. From the given answer figures, indicate how it will appear when opened ?

Question figure:





Answer: A

General Awareness

Instructions

For the following questions answer them individually

Question 51

Who was the first economist to have coined the terms "Micro Economics" and "Macro Economics" ?

- A Milton Friedman
- B Ragnar Frisch
- C J.M. Keynes
- D Paul Samuelson

Answer: B

Question 52

In a free enterprise economy, the decision on what shall be produced is made by

- A Demand
- B Income
- C Price mechanism
- D Cost

Answer: C

Question 53

The main reason for the high growth of money supply in India since 1970 has been the rise in

- A Foreign lending
- B Foreign borrowing
- C RBI credit to the government
- D Bank credit to the private sector

Answer: D

Question 54

Who was the first Muslim to be elected as President of the Indian National Congress ?

- A Syed Ahmad Khan
- B Agha Khan
- C Muhammad Ali Jinnah
- D Badruddin Tyabji

Answer: D

Question 55

Which of the following was not known to the Rigvedic period ?

- A Joint family system
- B Agriculture
- C Marriage system
- D Varna system

Answer: D

Question 56

The characteristic feature of democratic socialism is

- A Privatization
- B Liberalization
- C Nationalization
- D Socialization

Answer: C

Question 57

If a group of rich people use power for their selfish goals, it is called as

- A Monarchy
- B Oligarchy
- C Polity
- D Democracy

Answer: B

Question 58

Who said that "Man is born free and everywhere he is in chains"

- A Locke
- B Aristotle
- C Marx

D Rousseau

Answer: D

Question 59

A civil servant in India may exercise poliliberty by

- A joining any political party
- B contesting in the elections
- C criticizing the government
- D exercising his franchise

Answer: D

Question 60

The term 'Law' used in the pharse 'Rule of Law' refers to

- A Positive law
- B Natural law
- C Common law
- D Conventions of the Constitution

Answer: C

Question 61

The total physical product per unit of a variable input is known as

- A Average product
- B Average returne
- C Average physical product
- D Average revenue

Answer: C

Question 62

The discount on price when a large quantity is purchased is known as

- A Volume discount
- B Maximum discount
- C Minimum discount
- D Marginal discount

Answer: A

Question 63

What type of fruit is pineapple?

- A Siliqua
- B Sorosis
- C Syconus
- D Samara

Answer: B

Question 64

Strobilus is a structure associated with

- A Pea
- B Potato
- C Pinus
- D Palm

Answer: C

Question 65

Signet-ring is seen in the life cycle of

- A Mosquito
- B Plasmodium
- C Entamoeba
- D Giardia

Answer: B

Question 66

The number of occipital condyles in man is

- A One
- B Two
- C Three
- D Four

Answer: B

Question 67

Migratory larvae of Ascaris produce symptoms of pneumonia. This is known as

- A Down's syndrome
- B Klinefelter's syndrome
- C Turner's syndrome

D Loeffler's syndrome

Answer: D

Question 68

Which of the following animals is an osmoconformer ?

A Hagfish

B Seal

C Whale

D Rohu

Answer: A

Question 69

Which one of the following is the source of Solar energy ?

A Nuclear fission

B Nuclear fusion

C Artificial radioactivity

D X-ray emission

Answer: B

Question 70

Who, for the first time, successfully determined the charge of an electron ?

A Thomson

B Millikan

C Rutherford

D Coulomb

Answer: B

Question 71

The first Muslim king who invaded South India was

A Balban

B Mohammad bin Tughlaq

C Babar

D Alauddin Khijli

Answer: D

Question 72

The Great Bath was located in

- A Harappa
- B Mohenjodaro
- C Lothal
- D Kalibangan

Answer: B

Question 73

The Mughal judicial system was based on

- A Persian law
- B Hebrew law
- C Islamic law
- D Indian law

Answer: C

Question 74

Hurricanes are generally

- A active over the land
- B travelling in families
- C dust storms
- D active over the sea

Answer: A

Question 75

Orinoco oil belt is in

- A Dubai
- B Saudi Arabia
- C Venezuela
- D Brazil

Answer: C

Question 76

The highest peak in Africa is

- A Aconcagua
- B Kilimanjaro
- C McKinley

D Mount Elbrus

Answer: B

Question 77

A layer of the Earth made up of mixed metals and silicates is called

A Sial

B Sima

C Mantle

D Nife

Answer: C

Question 78

The exhaustion of soil fertility is the result of

A Cover cropping

B Multiple cropping

C Rotation cropping

D Over cropping

Answer: D

Question 79

Injection of weakened microbes to confer resistance to a disease is known as

A Transfusion

B Vaccination

C Inoculation

D Intimation

Answer: B

Question 80

Who, among the following, is the author of 'Das-Kapital'

A Rousseau

B Karl Marx

C Chanakya

D Montesquieu

Answer: B

Question 81

When and where will the next Olympics be held ?

- A Beijing, 2014
- B Shanghai, 2012
- C Rio-de-Janeiro, 2016
- D Taiwan, 2013

Answer: C

Question 82

A Persian form of singing a poem is called

- A Ghazal
- B Qawali
- C Thumri
- D Bhajan

Answer: A

Question 83

Green-house effect causes

- A increase of temperature
- B increase of moisture in air
- C decrease of temperature
- D decrease of moisture in air

Answer: A

Question 84

The advantages of rain-water harvesting is that it

- A helps in reducing floods
- B increases the ground water level
- C cause more rains
- D reduces floods and replenishes ground water

Answer: D

Question 85

The 'solder' used for connecting electronic circuits consists of

- A Lead and Tin
- B Tin and Iron
- C Copper and Lead

D Lead and Aluminium

Answer: A

Question 86

What type of molecular motion is responsible for heat conduction ?

A Translational

B Vibrational

C Rotational

D Spin

Answer: B

Question 87

Pick the odd one out.

A Compiler

B Interpreter

C Assembler

D Word processor

Answer: D

Question 88

MS-Office is an example of

A an operational system

B a telecommunication software

C a programming language

D a productivity software

Answer: D

Question 89

In India, the day ^{5th} September is celebrated as Teacher's Day to honour the birthday of

A Rabindra Nath Tagore

B Dr. S. Radhakrishnan

C Dr. Rajendra Prasad

D Mrs. Indira Gandhi

Answer: B

Question 90

Which among the following polluting agents is responsible for creating a hole in the ozone layer ?

- A CO
- B CFC
- C SO_2
- D CH_4

Answer: B

Question 91

Fly ash is

- A CO_2
- B Organic particulate matter
- C Small ash particles
- D NO_x

Answer: C

Question 92

Addition of chlorine to raw water before treatment is known as

- A Plain chlorination
- B Post-chlorination
- C Pre-chlorination
- D Super-chlorination

Answer: C

Question 93

Which of the following is not a water treatment technique ?

- A Reverse osmosis
- B Ion exchange
- C Electro-dialysis
- D Electrostatic precipitation

Answer: D

Question 94

Which one of the following is m major indoor air pollutantin India ?

- A Ozone
- B Peroxy Acetyl Nitrite (PAN)
- C Carbon monoxide

D Sulphur dioxide

Answer: C

Question 95

Multi Drug Therapy is for the infection of

A Leprosy

B AIDS

C Cholera

D Hepatitis

Answer: A

Question 96

Volvo, the car manufacturing company, introduced

A Alarm

B Fog light

C Seat belts

D Rear view mirrors

Answer: C

Question 97

The Dark Continent is

A Asia

B Australia

C Africa

D Europe

Answer: C

Question 98

The major constitution of air is

A Nitrogen

B Carbon dioxide

C Oxygen

D Hydrogen

Answer: A

Question 99

The souring of milk to curd is an example of

- A Saponification
- B Putrefaction
- C Fermentation
- D Esterfication

Answer: C

Question 100

Which one of the following compounds is formed when formaldehyde is treated with Grignard reagent ?

- A Primary alcohol
- B Secondary alcohol
- C Tertiary alcohol
- D Dihydric alcohol

Answer: A

General Engineering (Civil & Structural)

Instructions

For the following questions answer them individually

Question 101

The lintels are preferred to arches because

- A arches required more headroom to span the openings like doors, windows, etc.
- B arches require strong abutments to withstand arch thrust
- C arches are difficult in construction
- D All of the above

Answer: D

Question 102

The most suitable stone for building piers is

- A granite
- B limestone
- C marble
- D sandstone

Answer: A

Question 103

Number of modular bricks required for one cubic metre of brick masonry are

- A 400
- B 450
- C 550
- D 500

Answer: D

Question 104

The plasticity to mould bricks in suitable shape is contrived by

- A Alumina
- B Lime
- C Magnesia
- D Silica

Answer: A

Question 105

The crushing strength of a first class brick is

- A $3 \frac{N}{mm^2}$
- B $5.5 \frac{N}{mm^2}$
- C $10.5 \frac{N}{mm^2}$
- D $7.5 \frac{N}{mm^2}$

Answer: C

Question 106

Which of the following cements is suitable for use in urgent repairs of existing massive concrete structures such as large dams?

- A Ordinary portland cement
- B Low heat cement
- C Rapid hardening cement
- D Suitable resisting cement

Answer: B

Question 107

For polishing mosaic floors we use

- A Carbaolic acid
- B Muriatic acid
- C Acetic acid

D Oxalic acid

Answer: D

Question 108

For 15 mm thick cement plastering 1 : 6 on 100 sq. m new brick work, quantity of cement required is

A $0.200m^3$

B $0.247m^3$

C $0.274m^3$

D $0.343m^3$

Answer: D

Question 109

The base material for distemper is

A Chalk

B Lime

C Clay

D Lime putty

Answer: A

Question 110

The amount of water used in performing setting time test of cement is (assuming p = standard consistency of cement)

A $0.60 p$

B $0.65 p$

C $0.80 p$

D $0.85 p$

Answer: A

Question 111

Gypsum used in cement manufacturing acts as

A accelerator

B air entering agent

C plasticizer

D retarder

Answer: D

Question 112

The woodworks should be measured to nearest

- A 0.001 m
- B 0.002 m
- C 0.003 m
- D 0.004 m

Answer: B

Question 113

Anti-siphonage pipe is connected to

- A Main soil pipe
- B Bottom of P trap W.C
- C Top of P trap W.C
- D Side of Water Closet

Answer: C

Question 114

The main principle of field surveying is to work from

- A higher level to lower level
- B lower level to higher level
- C part of whole
- D whole to part

Answer: D

Question 115

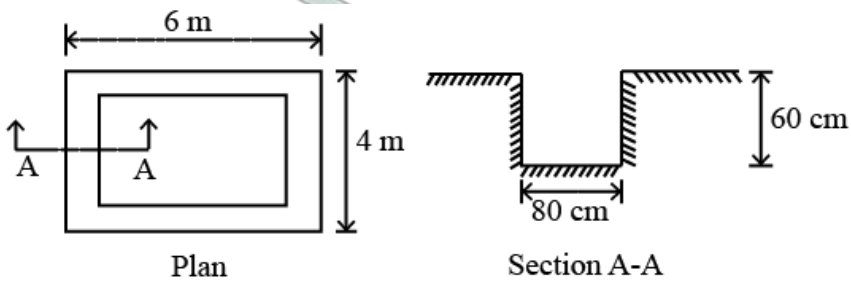
If 'i' is the rate of interest expressed in decimal and 'n' is the number of years, then coefficient of annual find I_c is

- A $I_c = \frac{[(1+i)^n - 1]}{(1+i) - 1}$
- B $I_c = \frac{i}{(1+i)^n - 1}$
- C $I_c = \frac{i}{(1-i)^n + 1}$
- D $I_c = \frac{i}{(1+i)^n + 1}$

Answer: B

Question 116

The above figure represents plan and section of an excavation layout. The volume of earthwork in excavation of foundation trench is



- A 6.528 cu.m
- B 8.064 cu.m
- C 8.832 cu.m
- D 9.600 cu.m

Answer: B

Question 117

If d be the diameter of MS or tor steel bars in mm, the standard weight (in kg) per metre of the bar is

- A $0.00618d^2$
- B $0.00618d$
- C $0.00816d^{\{2\}}$
- D $0.00816d$

Answer: A

Question 118

A level line is a

- A line parallel to the mean spheroidal surface of the earth
- B line passing through centre of cross hairs and centre of eye-piece
- C line passing through objective lens and the eye piece
- D horizontal line

Answer: A

Question 119

Ranging is defined as

- A measuring the distance from starting point
- B establishing intermediate points on a chain line
- C the distance between end points
- D a point on a chain line

Answer: B

Question 120

Compute the angle between the lines AB and AC, if their respective bearings are $52^{\circ}30'$ and $328^{\circ}45'$.

- A $276^{\circ}15'$
- B $6^{\circ}15'$
- C $111^{\circ}15'$
- D $83^{\circ}15'$

Answer: D

Question 121

The Whole circle Bearing of a line is $287^{\circ}15'$. The Reduced Bearing of the line is

- A $107^{\circ}15'W$
- B $17^{\circ}15'W$
- C $72^{\circ}15'W$
- D $107^{\circ}15'E$

Answer: C

Question 122

A line joining some fixed points on the main survey lines is called

- A check line
- B tie line
- C chain line
- D base line

Answer: B

Question 123

Which of the following methods of contouring is most suitable for hilly terrain?

- A Direct method
- B Square method
- C Cross-section method
- D Tacheometric method

Answer: D

Question 124

The angle between true meridian and the magnetic meridian at the time of observations is known as

- A Orientation

- B Magnetic declination
- C Magnetic bearing
- D Dip

Answer: B

Question 125

'Offsets' are

- A Lateral measurements from chain line
- B Ties or check lines which are perpendicular to chain line
- C Sets of minor measurements in chain surveying
- D Chain lines which go out of alignment

Answer: A

Question 126

The fore bearings of the lines AB and BC are 40° and 120° respectively. The included angle between AB and BC is

- A 40°
- B 60°
- C 80°
- D 100°

Answer: D

Question 127

If the sum of northing of a traverse exceeds the sum of southing by 1 m and sum of easting exceeds the sum of westings by 1 m, the resultant closing error and its true bearing are respectively

- A $\sqrt{2}m, N45^\circ E$
- B $1m, N45^\circ E$
- C $2m, N45^\circ W$
- D $2m, N45^\circ E$

Answer: A

Question 128

If in a closed traverse, the sum of the north latitudes is more than the sum of the south latitudes and also the sum of west departures is more than the sum of east departures, the bearing of the closing line is in the

- A SE quadrant
- B NE quadrant

C NW quadrant

D SW quadrant

Answer: C

Question 129

A 300 mm square bearing plate settles by 15 mm in a plate load test on a cohesive soil when the intensity of loading is 0.2 N/mm². The settlement of a prototype shallow footing 1 m square under the same intensity of loading is

A 15 mm

B 80 mm

C 50 mm

D 167 mm

Answer: C

Question 130

The specific speed for a turbine has the dimensions of

A $F^{\frac{1}{2}} L^{-\frac{3}{4}} T^{-\frac{3}{2}}$

B T^1

C $F^{\frac{1}{2}} L^{-\frac{5}{2}} T^{-\frac{3}{2}}$

D $F L^{-\frac{3}{4}} T^{-\frac{3}{2}}$

Answer: A

Question 131

Sand particles are made of

A Kaolinite

B Illite

C Montmorillonite

D Quartz

Answer: D

Question 132

A shallow foundation is defined as a foundation which

A has low bearing capacity

B has a depth of embedment less than its width

C is resting on the ground surface

D causes less settlement

Answer: B

Question 133

If the volume of voids is equal to the volume of solids in a soil mass, then the values of porosity and voids ratio respectively are

- A 1.0 and 0.0
- B 0.0 and 1.0
- C 1.5 and 1.0
- D 1.0 and 0.5

Answer: E

Question 134

The lime stabilization is very effective in treating

- A Sandy soils
- B Silty soils
- C Non-plastic soils
- D Plastic clayey soil

Answer: D

Question 135

In open channel flows, the characteristic length commonly used in defining the Reynolds number is the

- A depth of flow
- B wetted perimeter
- C hydraulic radius
- D area/top width

Answer: C

Question 136

Bulk modulus of a fluid is the ratio of

- A shear stress to shear strain
- B increase in volume to the viscosity of fluid
- C increase in pressure to the volumetric strain
- D critical velocity to the velocity of fluid

Answer: C

Question 137

The buoyancy depends upon the

- A pressure with which the liquid is displaced
- B weight of the liquid displaced

- C viscosity of the liquid
- D compressibility of the liquid

Answer: B

Question 138

The discharge over a rectangular notch is

- A inversely proportional to H^2
- B directly proportional to H^2
- C inversely proportional to H^5
- D directly proportional to H^5

Answer: B

Question 139

The most economical section of a rectangular channel is one having hydraulic radius equal to

- A twice the depth (b) half the breadth
- B half the breadth
- C half the depth
- D twice the breadth

Answer: C

Question 140

In a rectangular channel, the ratio of the specific energy at critical depth E_c to the critical depth y_c is

- A 2.0
- B 1.0
- C 1.5
- D 1.25

Answer: C

Question 141

The water utilizable by plants is available the form of

- A gravity water
- B hydroscopic water
- C capillary water
- D chemical water

Answer: C

Question 142

A surge tank is provided in hydropower schemes to

- A reduce water hammer pressures
- B reduce frictional losses
- C increase the net head
- D strengthen the penstocks

Answer: A

Question 143

In a two-dimensional flow fluid, if a velocity potential function ϕ exists which satisfies the relation $\frac{\partial^2 \phi}{\partial x^2} + \frac{\partial^2 \phi}{\partial y^2} = 0$ then the flow is

- A steady incompressible
- B steady laminar and incompressible
- C irrotational and incompressible
- D turbulent and incompressible

Answer: C

Question 144

Reynolds number is the ratio of the inertia force to the

- A surface tension force
- B viscous force
- C gravity force
- D elastic force

Answer: B

Question 145

A river training work is generally required when the river is

- A aggrading type
- B meandering type
- C degrading type
- D both (A) and (C)

Answer: B

Question 146

The populations of a town as per census records were 200000, 210000 and 230000 for the years 1981, 1991 and 2001 respectively. The population of the town as per geometric mean method in the year 2009 is

- A 244872

B 285872

C 246820

D None of the above

Answer: B

Question 147

If the stopping distance and average length of a vehicle are 18 m and 6 m respectively, then the theoretical maximum capacity (vehicles per hour) of a traffic lane at a speed of 10 m/sec is

A 1500

B 2000

C 2500

D 3000

Answer: A

Question 148

In highway construction on superelevated curves, the rolling shall proceed from

A sides towards the centre

B centre towards the sides

C clower edge towards the upper edge

D upper edge towards the lower edge

Answer: C

Question 149

The permissible limit of arsenic in drinking water as per the guidelines of WHO is

A 0.01 ppm

B 0.01 ppb

C 0.05 ppm

D 0.05 ppb

Answer: A

Question 150

Which one of the following sequences is the most suitable for treating raw surface water to make it suitable for drinking purpose?

A Screening → filtration → sedimentation → disinfection

B Screening → disinfection → sedimentation → filtration

C Screening → sedimentation → disinfection → filtration

D Screening → sedimentation → filtration → disinfection

Answer: D

Question 151

At the point of contraflexure

- A Bending moment is minimum
- B Bending moment is maximum
- C Bending moment is zero
- D Bending moment is zero and its sign changes

Answer: D

Question 152

A beam fixed at both ends carries a uniformly distributed load on entire length. The ration of bending moment at the support to the bending moment at mid span is given by

- A 0.5
- B 1.0
- C 1.5
- D 2.0

Answer: D

Question 153

In case of biaxial stress, the maximum value of shear stress is given by

- A Difference of the normal stress
- B Half the difference of the normal stresses
- C Sum of the normal stresses
- D Half of the sum of the normal stresses

Answer: B

Question 154

From a circular plate of diameter 6.0 cm, a circle out whose diameter is a dadius of the plate. The distance of centre of gravity of the remainder from the centre of circular plate is

- A 2.0
- B 1.5
- C 1.0
- D 0.5

Answer: D

Question 155

In a section undergoing pure bending, the neutral surface is subjected to

- A compression strain
- B tensile strain
- C zero strain
- D None of the above

Answer: C

Question 156

The ability of a material to absorb energy till the breaking or rupture takes place is known as

- A Hardness
- B Toughness
- C Brittleness
- D Softness

Answer: B

Question 157

A concentrated load W acts at the centre of a simply supported beam of length L . If the load is changed to a uniformly distributed load over the entire span, then the ratio of maximum deflection under concentrated load and under uniformly distributed load will be

- A 1.2
- B 1.3
- C $\frac{1}{4}$
- D $\frac{8}{5}$

Answer: D

Question 158

The shear diagram of a cantilever beam subjected to a concentrated load at the free end is given by a/an

- A Triangle
- B Rectangle
- C Parabola
- D Ellipse

Answer: B

Question 159

Deflection of the free end of a cantilever beam having a concentrated load W at mid span is given by

- A $\frac{WL^3}{3} EI$
- B $5 \frac{WL^3}{24} EI$

C $\frac{WL^3}{5 \cdot 48} EI$

D $\frac{WL^3}{48} EI$

Answer: C

Question 160

Of the several prismatic beams of equal lengths and of same material, the beam that can carry maximum load in flexure is the one having maximum

- A Depth of section
- B Area of cross-section
- C Section modulus
- D Moment of inertia

Answer: C

Question 161

The maximum deflection of a simply supported beam of effective span L and subjected to a central concentrated load W is given by

A $\frac{WL^3}{8} EI$

B $\frac{WL^3}{24} EI$

C $\frac{WL^3}{48} EI$

D $\frac{WL^3}{5 \cdot 384} EI$

Answer: C

Question 162

In a Mohr's circle of $\sigma - \tau$ plane ($\sigma = \text{normal stress}$, $\tau = \text{shear stress}$), the vertical diameter represents

- A Maximum shear stress
- B Maximum normal stress
- C Principal stress
- D Minimum normal stress

Answer: A

Question 163

A singly supported beam is carrying distributed load of 'zero' intensity over one support to linearly varying nature of intensity 'w' over the other support. The shape of BMD will be

- A linear
- B cubical parabolic
- C zero

D Minimum normal stress

Answer: B

Question 164

The maximum dimension of a core section for a rectangular cross-section under eccentric loading on a column ($b \times d$) is

A $\frac{b}{6}$

B $\frac{d}{6}$

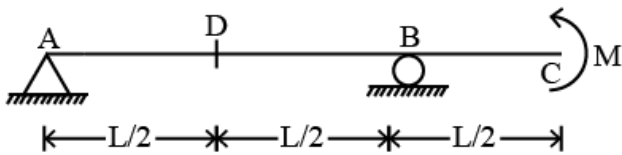
C $\frac{d}{8}$

D $\frac{b}{2}$ and $\frac{d}{3}$

Answer: D

Question 165

Shear force at the mid-span point D in the following beam is



A zero

B $\frac{M}{2L}$

C $\frac{M}{L}$

D $\frac{3M}{L}$

Answer: C

Question 166

Two identical simply supported beams of span 'l' are subjected to equal load 'W'. One beam is carrying the load 'W' at its centre (as carrying it in the form of u.d.l. over the entire span). The ratio of their mid-span bending moment will be

A $\frac{1}{2}$

B 2

C 4

D 8

Answer: B

Question 167

Angle of twist of a circular shaft under the action of a torsional moment T is given by

A $\frac{GJ}{TL}$

B $\frac{TL}{GJ}$

C $\frac{TJ}{GL}$

D $\frac{TG}{JL}$

Answer: B

Question 168

A structure which offers negligible or zero resistance on bending at any point is known as

A Beam

B Girder

C Lintel

D Cable

Answer: D

Question 169

The curvature at any point $\frac{1}{R}$ along the curve representing the deformed shape of a beam is given by

A $\pm \left[1 + \left(\frac{dy}{dx} \right)^2 \right]^{-\frac{1}{2}}$

B $\pm \left[1 + \left(\frac{d^2y}{dx^2} \right)^2 \right]^{-\frac{3}{2}}$

C $\pm \left[1 + \left(\frac{d^2y}{dx^2} \right)^2 \right]^{-\frac{1}{2}}$

D $\pm \left[1 + \left(\frac{dy}{dx} \right)^2 \right]^{-\frac{3}{2}}$

Answer: B

Question 170

The moment required to rotate the near and end of a prismatic beam through unit angle, without translation, the far end being fixed is

A $\frac{EI}{L}$

B $2 \frac{EI}{L}$

C $3 \frac{EI}{L}$

D $4 \frac{EI}{L}$

Answer: D

Question 171

A retaining wall of trapezoidal section having base width 'b' retains earth at its back. For no tension to be developed at base, the resultant force will intersect the base from centre line of the line, within a distance of

A $\frac{b}{3}$

B $\frac{b}{4}$

C $\frac{b}{5}$

D $\frac{b}{6}$

Answer: D

Question 172

The initial setting time of Ordinary Portland Cement (OPC) is

A 10 min

B 30 min

C 45 min

D 60 min

Answer: B

Question 173

The equivalent stiffness of two springs of stiffness S_1 and S_2 joined in series is given by $S =$

A $\frac{S_1 S_2}{S_1 + S_2}$

B $\frac{S_1 S_2}{S_1 + S_2}$

C $S_1 + S_2$

D $S_1 S_2$

Answer: A

Question 174

Buckling load for an axially loaded column with both ends fixed is given by

A $\frac{\pi^2 EI}{l^2}$

B $2 \frac{\pi^2 EI}{l^2}$

C $4 \frac{\pi^2 EI}{l^2}$

D $\frac{\pi^2 EI}{4l^2}$

Answer: C

Question 175

Poisson's ratio μ is defined as the ratio of

A axial strain to transverse strain

- B axial strain to shear strain
- C transverse strain to axial strain
- D shear stain to axial strain

Answer: C

Question 176

In a thin cylinder shell, the ratio of longitudinal stress to hoop stress is

- A 0.5
- B 1.0
- C 1.5
- D 2.0

Answer: A

Question 177

The grade of concrete M 20 means that characteristic compressive strength of 15 cm cubes after 28 days is given by

- A $10 \frac{N}{mm^2}$
- B $15 \frac{N}{mm^2}$
- C $20 \frac{N}{mm^2}$
- D $25 \frac{N}{mm^2}$

Answer: C

Question 178

You are asked to construct a massive concrete dam. The type of cement you will use is

- A Ordinary portland cement
- B Rapid hardening portland cement
- C Low heat cement
- D Blast furnace slag cement

Answer: C

Question 179

The object of curing is not to

- A prevent the loss of water by evaporation
- B reduce the shrinkage of cement concrete
- C preserve the properties of concrete
- D reduce the strength of concrete

Answer: D

Question 180

Which of the following is added for quick setting of cement?

- A Gypsum
- B Alum
- C Zinc sulphate
- D Aluminium sulphate

Answer: D

Question 181

High percentage of C3S and low percentage of C2S in a cement will result in

- (i) rapid hardening
- (ii) high early strength with high heat generation
- (iii) more resistance to chemical attack

The correct answer is

- A Only (i)
- B Only (iii)
- C Both (i) and (ii)
- D Both (ii) and (iii)

Answer: C

Question 182

As per IS 456, splitting tensile-strength (f_{cr}) of concrete may be estimated from compressive strength as

- A $f_{cr} = 0.65 \sqrt{f_{ck}}$
- B $f_{cr} = 0.7 \sqrt{f_{ck}}$
- C $f_{cr} = 0.75 \sqrt{f_{ck}}$
- D $f_{cr} = 0.8 \sqrt{f_{ck}}$

Answer: B

Question 183

Maximum admissible water-cement ratio for mild environmental exposure should be

- A 0.55
- B 0.50
- C 0.45
- D 0.40

Answer: A

Question 184

Air entrainment in the concrete increases

- A workability
- B strength
- C the effect of temperature variation
- D the unit weight

Answer: A

Question 185

The minimum horizontal distance between two main reinforcement bars should be

- A diameter of larger bar or 5 mm more than the nominal maximum size of coarse aggregate, whichever is higher
- B 5 mm more than the nominal size of the aggregate only
- C 5 mm more than the diameter size of the aggregate only
- D None of the above

Answer: A

Question 186

During the manufacture of Portland cement, gypsum or Plaster of Paris is added to

- A increase the strength of cement
- B modify the colour of cement
- C reduce heat of hydration of cement
- D adjust setting time of cement

Answer: D

Question 187

Minimum percentage of tension steel in an RCC beam for Fe 500 steel is

- A 0.12
- B 0.17
- C 0.22
- D 0.80

Answer: D

Question 188

As per IS 456, the effective length cantilever shall be taken as

- A clear span
- B $\frac{\text{clear span} + \text{effectivedepth}}{2}$

C clear span + effective depth

D clear span + effective width

Answer: C

Question 189

If the modular ratio is 'm', stress ratio in steel and concrete is 'r', then the critical neutral axis constant 'k' is given by

A $\frac{m}{m-r}$

B $\frac{m}{m+r}$

C $\frac{m+r}{m}$

D $\frac{m^2}{r}$

Answer: B

Question 190

For two way action, i.e. punching shear, the calculated shear stress, τ_y , should satisfy the following relation $\tau_y \leq K_s \tau_c$ where τ_c according to working stress method is expressed as

A $0.1 \sqrt{f_{ck}}$

B $0.16 \sqrt{f_{ck}}$

C $0.25 \sqrt{f_{ck}}$

D $0.4 \sqrt{f_{ck}}$

Answer: B

Question 191

Diagonal tension in a reinforced concrete beam

A is maximum at neutral axis

B decreases below neutral axis and increases above neutral axis

C increases below neutral axis and decreases above neutral axis

D remain constant throughout the depth

Answer: C

Question 192

In a singly reinforced beam, if the permissible stress in concrete reaches earlier than the permissible stress in steel the beam section is called

A Under reinforced section

B Over reinforced section

C Balanced section

D Economic section

Answer: B

Question 193

If σ_s is the stress in bar and τ_{bd} is the design bond stress, then the development length of a bar of diameter ϕ is given by

A $\frac{4\phi\sigma_s}{\tau_{bd}}$

B $\frac{\phi\sigma_s}{4\tau_{bd}}$

C $\frac{2\phi\sigma_s}{3\tau_{bd}}$

D $\frac{\phi\sigma_s}{3\tau_{bd}}$

Answer: B

Question 194

Side face reinforcement shall be provided in the reinforced concrete beam when depth of web in the beam exceeds

A 500 mm

B 750 mm

C 1000 mm

D 1200 mm

Answer: B

Question 195

A cantilever retaining wall should not be used for heights more than

A 4 m

B 6 m

C 8 m

D 10 m

Answer: B

Question 196

The minimum edge and end distance from the centre of any hole to the nearest flame cut edge shall not be less than

A 1.5 times hole dia

B 1.7 times hole dia

C 2 times hole dia

D $\frac{1.5 \times \text{bolt}}{\text{rivet dia}}$

Answer: B

Question 197

The distance between two rivets measured perpendicular to the direction of applied force is known as

- A pitch
- B gauge
- C staggered pitch
- D edge distance

Answer: B

Question 198

For simply supported beam, the allowable deflection shall not exceed

- A $\frac{1}{325}$ of span
- B $\frac{1}{350}$ of span
- C $\frac{1}{375}$ of span
- D $\frac{1}{400}$ of span

Answer: A

Question 199

The beams supporting the stair steps, are generally known as

- A headers
- B trimmers
- C stringers
- D spandrel beam

Answer: C

Question 200

.Maximum size of a fillet weld for a plate of square edge is

- A 1.5 mm less than the thickness of the plate
- B one-half of the thickness of the plate
- C thickness of the plate itself
- D 1.5 mm more than the thickness of the plate

Answer: A