SSC JE Mechanical Engineering 22nd Jan 2018 Shift-1

General Intelligence and Reasoning

Instructions
For the following questions answer them individually

Question 1

In the following question, select the related word pair from the given alternatives.
Rain : Clouds :: ? : ?

A Rice : Food

B Grey : Colour

C Heat : Sun

D Snow : Mountains

Answer: C

Question 2

In the following question, select the related word from the given alternatives.
Cactus : Plant :: Rice : ?

A Basmati

B Crop

C White

D Rabi

Answer: B

Question 3

In the following question, select the related word from the given alternatives.
Pink : Colour :: Eagle : ?

A Black

B Symbol

C Bird

D Sky

Answer: C

Question 4

In the following question, select the related letter pair from the given alternatives.
TOM : NIG :: ? : ?

A EAT : YUN

B EAT : XXM

C FAT : LMV

D EAT : ZXC

Answer: A

Question 5

In the following question, select the related letters from the given alternatives.
LERI : PJVN :: MONT : ?

A WRTY

B QTRY

C RITY

D RQYB

Answer: B

Question 6

In the following question, select the related letters from the given alternatives.
SAT : WEX :: MET : ?

A AQI

B IYX

C FHY

D QIX

Answer: D

Question 7

In the following question, select the related number from the given alternatives.
43 : 7 :: 23 : ?

A 6

B 4

C 7

D 5

Answer: D

Question 8

In the following question, select the related number from the given alternatives.
38 : 53 :: 53 : ?

A 72

B 68

C 79

D 87

Answer: B

Question 9

In the following question, select the related number from the given alternatives.
9 : 81 :: 11 : ?

A 78

B 93

C 121

D 146

Answer: C

Question 10

In the following question, select the odd word from the given alternatives.

A Goggle

B Purse

C Accessories

D Belt

Answer: C

Question 11

In the following question, select the odd word from the given alternatives.

A Grapes

B Guava

C Cauliflower

D Orange

Answer: C

Question 12

In the following question, select the odd word from the given alternatives.

A Sparrow

B Rat

C Ostrich

D Parrot

Answer: B

Question 13

In the following question, select the odd letters from the given alternatives.

A GCXTO

B KGBXS

C RNIEX

D QMHDY

Answer: C

Question 14

In the following question, select the odd letters from the given alternatives.

A SOKG

B AWSO

C RNJF

D CYTP

Answer: D

Question 15

In the following question, select the odd letters from the given alternatives.

A KNQ

B DGJ

C WZB

D TWZ

Answer: C

Question 16

In the following question, select the odd letters from the given alternatives.

A 7 - 11

B 12 - 16

C 14 - 18

D 9 - 15

Answer: D

Question 17

In the following question, select the odd letters from the given alternatives.

A 2 - 4

B 3 - 9

C 4 - 18

D 5 - 25

Answer: C

Question 18

In the following question, select the odd letters from the given alternatives.

A 76 - 42

B 92 - 20

C 73 - 21

D 93 - 27

Answer: B

Question 19

Arrange the given words in the sequence in which they occur in the dictionary.
1. Flagrant
2. Flavour
3. Flatter
4. Flick
5. Flawed

A 13254

B 31254

C 23541

D 32541

Answer: A

Question 20

According to dictionary, which of the following word will come at THIRD position?
1. Heritage
2. Helpful
3. Hectic
4. Heroic
5. Heroism

A Hectic

B Heritage

C Heroic

D Helpful

Answer: B

Question 21

From the given alternatives, according to dictionary, which word will come at LAST position?

A Juvenile

B Justify

C Judge

D Justice

Answer: A

Question 22

A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.
F, M, T, ?, H, O

A B

B C

C A

D D

Answer: C

Question 23

A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.
ROK, LIE, FCY, ZWS, ?

A LAQ

B SRV

C TQM

D FMQ

Answer: C

Question 24

A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.
FAQ, LGW, RMC, ?, DYO

A VIR

B XSI

C LSI

D MIS

Answer: B

Question 25

In the following question, select the missing number from the given alternatives.
14, 22, 49, 113, 238, ?

A 386

B 532

C 454

D 576

Answer: C

Question 26

In the following question, select the missing number from the given alternatives.
42, 21, 21, 31.5, 63, ?

A 169.75

B 157.5

C 152.5

D 126.75

Answer: B

Question 27

In the following question, select the missing number from the given alternatives.
14, 44, 135, 409, 1232, ?

A 2962

B 3340

C 3702

D 3406

Answer: C

Question 28

E is sitting between D and A, B is to the right of A, C is at one of the ends and C and D are sitting next to each other. Who is sitting third?

A D

B A

C B

D E

Answer: D

Question 29

Showing a photograph of a married couple B said that the gentleman in it was his father's father and A said that the lady in it was her mother. How is A related to B?

A A is B's mother's sister

B A is B's sister

C A is B's Father's sister

D A is B's mother

Answer: C

Question 30

From the given alternative words select the word which cannot be formed using the letters of the given word.
MERCANTILE

A truce

B learn

C trace

D claim

Answer: A

Question 31

If OLYMPUS is coded as MJWKNSQ, then how will TEN be coded as?

A RCL

B GVM

C SDM

D UFO

Answer: A

Question 32

In a certain code language, 1875 means 'wound the round watch', 6143 means 'a cake is round' and 7321 means 'watch a round wheel'. Find the code for 'watch'.

A 1

B 8

C 5

D 7

Answer: D

Question 33

In a certain code language, '$+$' represents '$-$', '$-$' represents '$\times$', '$\times$' represents '$\div$' and '$\div$' represents '$+$'. Find out the answer to the following question.
$96 \times 4 \div 125 + 25 - 5 = ?$

A 23

B 24

C 50

D 8

Answer: B

Question 34

If 17 $ 22 = 4 and 56 $ 13 = 7, then find the value of 71 $ 25 = ?

A 56

B 96

C 1

D 8

Answer: C

Question 35

If A $ B means A is son of B, A # B means A is brother of B and If A * B means A is father of B, then what does X # Y * Z $ W mean?

A W is X's brother's wife

B W is X's wife

C W is X's mother

D W is X's sister

Answer: A

Question 36

Select the missing number from the given responses

1	4	2
2	7	10
3	?	12

A 3

B 9

C -3

D 11

Answer: D

Question 37

Which of the following terms follows the trend of the given list?
OOXXXXX, OXOXXXX, OXXOXXX, OXXXOXX, OXXXXOX, _____.

A XOXXXXO

B XOXXXOX

C OXXXOXX

D OXXXXXO

Answer: D

Question 38

A scientist is studying the behaviour of an ant. The ant picks food and walks 5 cm North, then it turns to its right and walks for another 11 cm. then it turns right and walks 3 cm, then it turns West and walks 15 cm, then finally it turns to its left and walks 2 cm. Where is the ant now with respect to its starting point?

A 4 cm East

B 26 cm West

C 4 cm West

D 26 cm East

Answer: C

Question 39

Two football players start running from the same point on the ground. Player A runs 10 km East, then turns to his left and runs 13 km. In the meanwhile Player B runs 6 km South, then he runs 3 km East, the he turns to his left and runs 19 km. Where is Player A with respect to Player B?

A 7 km West

B 7 km East

C 13 km East

D 13 km West

Answer: B

Question 40

In the question two statements are given, followed by two conclusions, I and II. You have to consider the statements to be true even if it seems to be at variance from commonly known facts. You have to decide which of the given conclusions, if any, follows from the given statements.

Statement I: Some chapters are physics
Statement II: All science is physics

Conclusion I: All science is chapters
Conclusion II: Some physics is science

A Only conclusion I follows

B Only conclusion II follows

C Both conclusions I and II follow

D Neither conclusion I nor conclusion II follows

Answer: B

Question 41

In the question three statements are given, followed by three conclusions, I, II and III. You have to consider the statements to be true even if it seems to be at variance from commonly known facts. You have to decide which of the given conclusions, if any, follows from the given statements.

Statement I: All success is victory
Statement II: All luck is success
Statement III: Some hard work is luck

Conclusion I: Some success is hard work
Conclusion II: Some hard work is victory
Conclusion III: No victory is luck

A Only conclusions I and II follow

B Only conclusions II and III follow

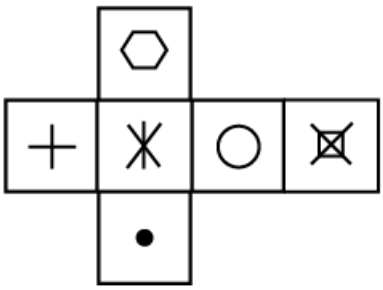
C Only conclusions I and III follow

D All conclusions I, II and III follow

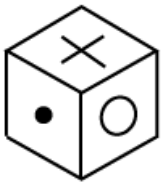
Answer: A

Question 42

Which of the following cube in the answer figure cannot be made based on the unfolded cube in the question figure?



A



B

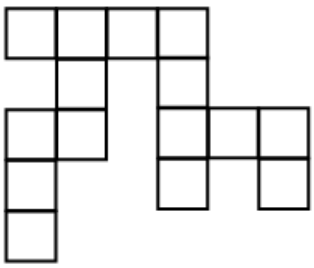
C

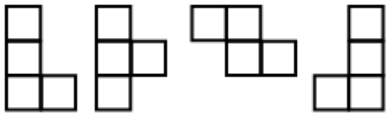
D

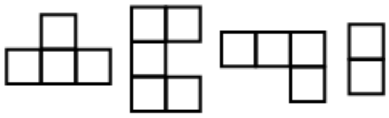
Answer: A

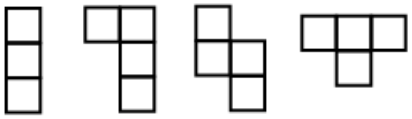
Question 43

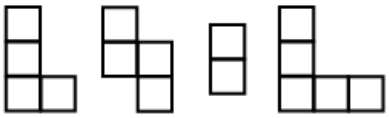
Which of the following answer figure patterns can be combined to make the question figure?



A 

B 

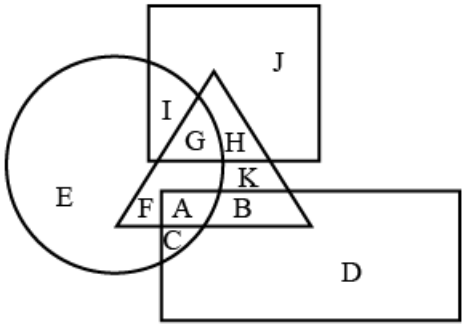
C 

D 

Answer: B

Question 44

In the following figure, square represents Professors, triangle represents Social Workers. circle represents Dieticians and rectangle represents Men. Which set of letters represents Dieticians who are not men?



A EFGI

B BDKHJ

C IGAC

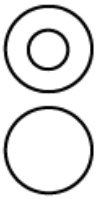
D DEJI

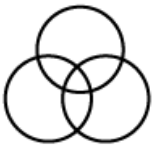
Answer: A

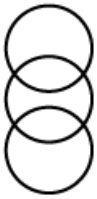
Question 45

Which of the following Venn Diagram represents the relationship between Butterflies, Animals and Insects?

A 

B 

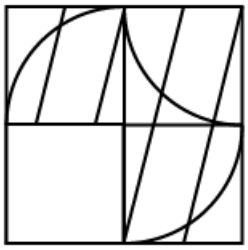
C 

D 

Answer: A

Question 46

Which answer figure will complete the pattern in the question figure?



A 

B 

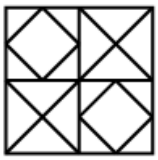
C 

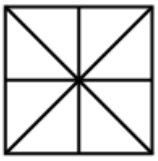
D 

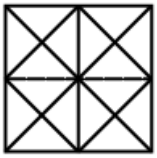
Answer: C

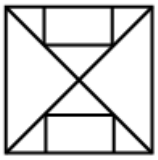
Question 47

From the given answer figures, select the one in which the question figure is hidden/embedded.

A 

B 

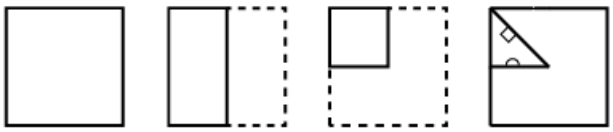
C 

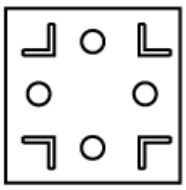
D 

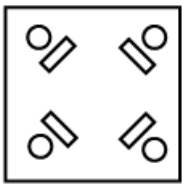
Answer: C

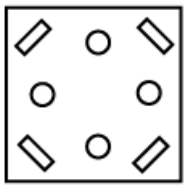
Question 48

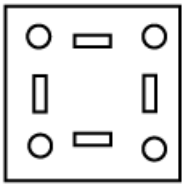
A piece of paper is folded and punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened.



A 

B 

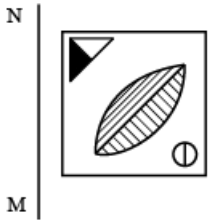
C 

D 

Answer: C

Question 49

If a mirror is placed on the line MN, then which of the answer figures is the right image of the given figure?



A 

B 

C 

D 

Answer: D

Question 50

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 shown in the given two matrices. 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, for example 'C' can be represented by 43, 41 etc and '0' can be represented by 97. 78 etc. Similarly. you have to identify the set for the word 'SPAN'.

Matrix I

	0	1	2	3	4
0	M	M	M	I	E
1	A	M	J	I	A
2	F	I	M	I	E
3	I	J	A	L	K
4	D	C	A	C	L

Matrix II

	5	6	7	8	9
5	N	V	Q	U	S
6	R	S	T	U	N
7	S	Z	X	O	V
8	X	S	P	W	P
9	U	X	O	Y	Y

A 66,87,33,56

B 59,78,42,31

C 86,89,32,55

D 78,43,22,98

Answer: C

General Awareness

Instructions

For the following questions answer them individually

Question 51

Preliminary expenses are the examples of .....

A Capital expenditure

B Capital gain

C revenue expenditure

D deferred revenue expenditure

Answer: A

Question 52

Which economic activity cannot be included in the tertiary sector?

A Working in a call-centre

B Tuition occupation

C Bee-keeping

D Banking

Answer: C

Question 53

Which of the following statement is true for the Public Sector Unit?

A Most of assets is owned by a group of people

B Most of assets is owned by big companies

C Most of assets is owned by government

D Most of assets is owned by an individual

Answer: C

Question 54

The percentage of India's population in the total population of the world as per 2011 census is: .....

A 17.5%

B 18.01%

C 19.35%

D 20.25%

Answer: A

Question 55

Which of the following five year plan of India recognized human development as the core of development efforts?

A Eighth five year plan

B Ninth five year plan

C Tenth five year plan

D Eleventh five year plan

Answer: A

Question 56

Which of the following thinker is associated with "the concept of political sovereignty"?

A MacIver

B Socrates

C Rousseau

D Plato

Answer: C

Question 57

Who said, "A good citizen makes a good state and a bad citizen makes a bad state"?

A Plato

B Aristotle

C G. B. Shaw

D Rousseau

Answer: B

Question 58

Panchayat Samiti at the block level in India is a/an _____.

A Advisory Body

B Coordinating Authority only

C Supervisory Authority only

D Administrative Authority

Answer: D

Question 59

According to Indian Constitution, who decides the salary of members of Parliament?

A Union Council of Ministers

B Parliament

C Supreme Court

D President of India

Answer: B

Question 60

Which one of the following is not correctly matched?

A Eighth Schedule : Languages

B Second Schedule : Form of Oath of office

C Fourth Schedule : Allocation of seats in Rajya Sabha

D Tenth Schedule : Defection related provisions

Answer: B

Question 61

When did the Chinese traveler 'Sung Yun' come to India?

A 510 AD

B 518 AD

C 525 AD

D 528 AD

Answer: B

Question 62

Which among the following state 'Odantpuri' education center was situated?

A Bengal

B Gujarat

C Bihar

D Tamil Nadu

Answer: C

Question 63

Who was the founder of Bahmani Kingdom?

A Hasan Gangu

B Firoz Shah

C Mahmud Gawan

D Asaf Khan

Answer: A

Question 64

During whose rule in India did the Khilafat movement begin?

A Lord Mountbatten

B Lord Dalhousie

C Lord Chelmsford

D Lord Curzon

Answer: C

Question 65

Who among the following was the founder of the Arya Mahila Samaj in the early 1880s?

A Swami Dayananda Saraswati

B Swami Vivekananada

C Ramabai Ranade

D Pandita Ramabai

Answer: D

Question 66

Dasht-e Kavir Desert is located in which country?

A Iran

B Saudi Arab

C Iraq

D Sudan

Answer: C

Question 67

Which of the following layers is called "Barysphere"?

A Earth's most internal layer

B Earth's intermediate layer

C Earth's topmost layer

D Lowest part of the atmosphere where climate changes occur

Answer: A

Question 68

The Blue Nile river originates from which of the following lakes?

A Lake Victoria

B Lake Tana

C Lake Edward

D Lake Albert

Answer: B

Question 69

Which of the following states of India has the largest percentage of geographical area under forest as per the report of the Forest survey of India?

A Manipur

B Meghalaya

C Mizoram

D Nagaland

Answer: C

Question 70

At which of the following towns the Alaknanda and the Bhagirathi combines to form River Ganga?

A Haridwar

B Rishikesh

C Rudraprayag

D Devprayag

Answer: D

Question 71

Nirvana Fund' was set up by NSDC for financial help to

A Entrepreneurs from the bottom rungs of society

B Displaced Kashmiri Pandits

C Old age people having no means of livelihood

D Ventures of selected candidates trained under PMKVY but did not get any job.

Answer: D

Question 72

Nakul Swasthya Patra' is a scheme by the Government for which among the following purposes?

A Wellness of animals

B Wellness of animal owners

C Taking care of lactating mother in the rural areas

D Taking care of newborn babies in the rural areas

Answer: A

Question 73

Which mine of India was in the news recently for becoming the country's first iron-ore mine to have a solar plant for reducing carbon footprint?

A Talchar mine

B Koraput mine

C Noamundi mine

D Ratnagiri mine

Answer: C

Question 74

Where will the Summer Olympics be held in 2028?

A Sydney

B Paris

C Los Angeles

D Copenhagen

Answer: C

Question 75

- Which country has won the 2017 Davis Cup Tennis Tournament?

A Switzerland

B Serbia

C France

D Belarus

Answer: C

Question 76

"You are Unique" is written by .....

A Dr. A. P. J. Abdul Kalam

B Khushwant Singh

C Taslima Nasrin

D Arvind Adiga

Answer: A

Question 77

The third Indian Council for Cultural Relations (ICCR) Distinguished Indologist Award for the year 2017 was awarded to Japanese professor .....

A Hiroshi Marui

B Shimamaru Marui

C Nagasaki Marui

D Toyota Marui

Answer: A

Question 78

Which of the following city has became first Indian city to get UNESCO's world heritage city tag?

A Jaipur

B Ahmedabad

C Gandhi Nagar

D Allahabad

Answer: B

Question 79

In June 2017, which of the following countries have signed a protocol of cooperation in the field of archive?

A India and Israel

B India and Portugal

C India and Netherland

D India and Iran

Answer: B

Question 80

India has signed an agreement to provide USD 318 million as line of credit for developing railway sector of which of the following country?

A Bangladesh

B Nepal

C China

D Sri Lanka

Answer: D

Question 81

Dot Matrix is a type of .....

A Tape

B Disk

C Printer

D Bus

Answer: C

Question 82

The secondary storage devices can only store data but they cannot perform .....

A Arithmetic operations

B Logic operations

C Fetch operations

D All options are correct

Answer: D

Question 83

In the modern periodic table metals, metalloids and non metals are found in which block?

A s-Block

B p-block

C d-block

D f-block

Answer: B

Question 84

Cinnabar is ore of which of the following?

A Magnesium

B Aluminium

C Mercury

D Iron

Answer: C

Question 85

In which of the following mirror size of image formed is always equal to the size of object?

A Convex mirror

B Concave mirror

C Plane mirror

D Both convex and concave mirror

Answer: C

Question 86

Mass of a hydrogen atom is how many time the mass of an electron?

A 1000

B 8000

C 1837

D 5000

Answer: C

Question 87

Which of the following are Fabrics that may contain polyester?
I. Polycot
II. Polywool
III. Terrycot

A Only I and II

B Only I and III

C Only II and III

D All I, II and III

Answer: D

Question 88

Which of the following term does NOT represent electrical power in circuit?

A I^2R

B IR^2

C VI

D $\frac{V^2}{R}$

Answer: B

Question 89

A positively charged particle projected towards west is deflected towards north by a magnetic field. What is the direction of magnetic field?

A toward south

B toward east

C downward

D upward

Answer: D

Question 90

Which of the following is NOT positively charged?

A Alpha particle

B Proton

C Helium nucleus

D Electron

Answer: D

Question 91

Which is a water soluble Vitamin?

A Vitamin A

B Vitamin C

C Vitamin D

D Vitamin K

Answer: B

Question 92

Match the items given in column(A) with those in column(B).

Column - A	Column - B
I. Frog	1. Skin
II. Leaves	2. Stomata
III. Earthworm	3. Lungs and skin

A I-3, II-2, III-1

B I-1, II-2, III-3

C I-3, II-1, III-2

D I-2, II-1, III-3

Answer: A

Question 93

How many number of chambers are there in human heart?

A Two

B Three

C Four

D Five

Answer: D

Question 94

Which of the following is NOT present in a matured stomata?

A Plasmodesma

B Chloroplast

C Cell wall

D Vacuole

Answer: A

Question 95

What is/are the cause(s) of arise hypermetropia?

A Excessive curvature of the eye lens

B Elongation of the eye ball

C Focal length of the eye lens is too long.

D No option is correct

Answer: C

Question 96

Antibiotics are useful for which type of infections?

A Only bacteria

B Only virus

C Both bacteria and virus

D Neither bacteria nor virus

Answer: A

Question 97

Which one of the following is NOT responsible for water shortage?

A Rapid growth of industries

B Increasing population

C Forestation

D Mismanagement of water resources

Answer: C

Question 98

Which gas is major contributor to greenhouse effect?

A Carbon dioxide

B Chloroflurocarbon

C Sulphur dioxide

D Nitrogen dioxide

Answer: A

Question 99

Which of the following is NOT a major problem in development of resources?

A Depletion of resources for satisfying the greed of few individuals

B Accumulation of resources in few hands.

C An equitable distribution of resources.

D Indiscriminate exploitation of resources

Answer: D

Question 100

Which of the following is NOT man made ecosystem?

A Orchards

B Home aquarium

C Botanical gardens

D Grassland

Answer: D

General Engineering (Mechanical)

Instructions
For the following questions answer them individually

Question 101

The number of links (l) which is required to form a kinematic chain can be expressed in term of the number of pairs (p) as _____.

A l = 2p - 4

B l = 2p - 3

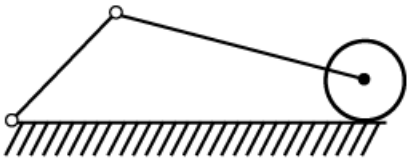
C l = 2p - 2

D l = 2p - 5

Answer: A

Question 102

What is the total number of links and joints in the mechanism as shown in the figure?



A 3 and 3

B 3 and 2

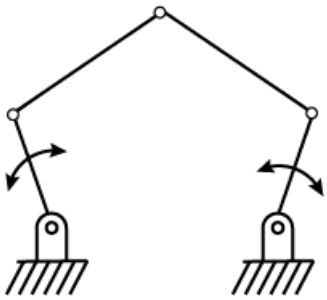
C 4 and 3

D 4 and 4

Answer: D

Question 103

What is the degree of freedom of the mechanism shown below?



A 1

B 2

C 3

D 4

Answer: B

Question 104

The graph of turning moment diagram is drawn between _____.

A crank angle and crank radius

B crank angle and crank effort

C crank effort and crank angle

D crank radius and crank angle

Answer: C

Question 105

The mass of flywheel of a steam engine is 3250 kg with the radius of gyration of 1 m. The starting torque of the engine is 4500 N-m. What is the angular acceleration (rad/s^2) of the flywheel?

A 3.4

B 2

C 2.48

D 1.38

Answer: D

Question 106

A pulley is driven by a flat belt and the maximum tension produced in the belt is of 1400 N. The belt has the density of 1000 kg/m ^{3}, 100 mm wide and 5 mm thick. What is the speed (m/sec) of the belt for the maximum power?

A 32

B 31

C 30.55

D 3.05

Answer: C

Question 107

The rotary internal combustion engine is the inversion of _____.

A four bar link chain

B double slider crank chain

C single slider crank mechanism

D Rocker crank mechanism

Answer: C

Question 108

The pressure distribution in the uniform wear theory is _____.

A directly proportional to radius

B directly proportional to the square of radius

C inversely proportional to radius

D inversely proportional to the square of radius

Answer: C

Question 109

When the friction lining is new, the wear varies _____.

A directly to radius

B inversely to radius

C directly to the square of radius

D inversely to the square of radius

Answer: A

Question 110

What is the radial distance of a tooth from the pitch circle to the top of the tooth known as?

A Dedendum

B Addendum

C Pitch circle diameter

D Module

Answer: B

Question 111

Which of the following statement is TRUE about the contact ratio?

A Varies directly to the length of the arc of contact

B Inversely proportional to the module

C Inversely proportional to the circular pitch

D All options are correct

Answer: D

Question 112

Which of the following is the type of pendulum governor?

A Hartnell governor

B Proell governor

C Porter governor

D Watt governor

Answer: D

Question 113

Which of the following governors does not have central load attached to their sleeves?

A Porter governor

B Watt governor

C Proell governor

D None of these

Answer: B

Question 114

What will be the vertical height (m) of a watt governor, if the speed of rotation is 80 rpm?

A 1.4

B 1.14

C 0.14

D 0.11

Answer: C

Question 115

Which of the following term defines the size of the cam?

A Base circle

B Prime circle

C Pitch circle

D Pitch curve

Answer: A

Question 116

What term is used for the combined effect of all the forces on a body?

A Load

B Stress

C Strain

D None of these

Answer: A

Question 117

Which of the following load does not act on the considerable length of the beam?

A Uniformly distributed

B Triangular

C Point

D Uniformly varying

Answer: C

Question 118

Which term states the S.I unit of stress?

A kN/mm

B N/mm^2

C N/mm^3

D m^3/sec

Answer: B

Question 119

Maximum shear stress theory was postulated by _____.

A S T Venant

B Mohr

C Rankine

D Tresca

Answer: D

Question 120

The equivalent length of the column when both the ends are fixed is _____.

A 1

B 1/2

C 1/4

D 2l

Answer: B

Question 121

The slenderness ratio of the columns is _____.

A directly proportional to the effective length

B directly proportional to the least radius of gyration

C directly proportional to the square of effective length

D directly proportional to the square of least radius of gyration

Answer: A

Question 122

Rankine theory is applicable to the _____.

A Short strut/column

B Long column

C Both short and long column

D None of these

Answer: C

Question 123

Which of the following assumptions is INCORRECT about the long column?

A The column behaves elastically.

B The load acts perfectly axial and passes through the centroid of the column section.

C The weight of the column is neglected.

D The material is non-homogeneous and anisotropic.

Answer: D

Question 124

What is the maximum shear stress on the wall of a thin cylinder, if it has a diameter of d, thickness of t and the gauge pressure in the cylinder is p?

A $\frac{pd}{t}$

B $\frac{pd}{4t}$

C $\frac{pd}{2t}$

D $\frac{pd}{8t}$

Answer: D

Question 125

What is the volumetric strain in the thin cylinder subjected to internal pressure having hoop stress of 200 MPa, modulus of elasticity, E = 200 GPa and poissons ratio = 0.25?

A $\frac{20}{1000}$

B $\frac{2}{1000}$

C $\frac{0.2}{1000}$

D $\frac{0.02}{1000}$

Answer: B

Question 126

The property of the material to regain its original shape after deformation when the external forces are removed is _____.

A plasticity

B elasticity

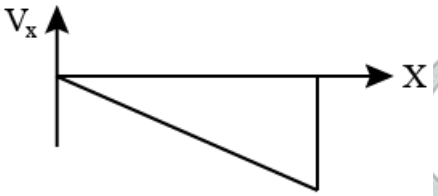
C durability

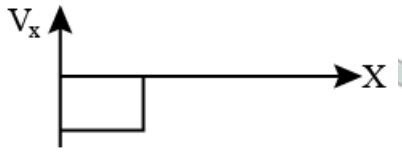
D None of these

Answer: B

Question 127

The correct shear force diagram for the cantilever beam with uniformly distributed load over the whole length of the beam is-

A 

B 

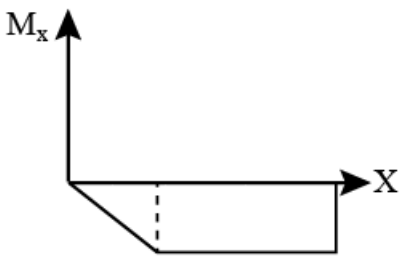
C 

D 

Answer: A

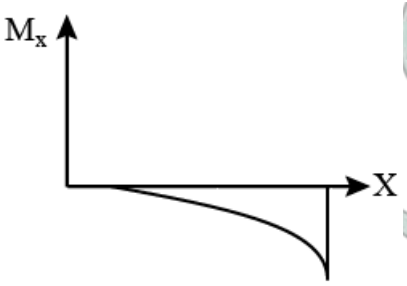
Question 128

Which of the following is the CORRECT bending moment diagram for the cantilever beam carrying uniformly varying load from zero at free and w/unit length at the fixed end?

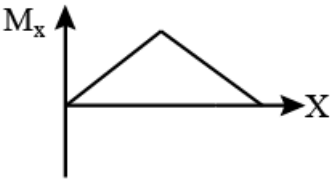
A 

B 

C



D



Answer: B

Question 129

A rod of dimension 20 mm x 20 mm is carrying an axial tensile load of 10 kN. The tensile stress developed is _____.

A 0.025 MPa

B 0.25 MPa

C 25 MPa

D 250 MPa

Answer: C

Question 130

Which is the CORRECT option for the polar moment of inertia of the solid shaft?

A $J = \frac{\pi}{64} d^4$

B $J = \frac{\pi}{32} d^4$

C $J = \frac{\pi}{16} d^2$

D $J = \frac{\pi}{16} d^4$

Answer: B

Question 131

The triple point on a P-V diagram is _____.

A a line

B a point

C a triangle

D not present

Answer: A

Question 132

Which of the following statement related to entropy is TRUE?

A Minimum entropy is observed when the system is in equilibrium with the surrounding.

B At absolute zero temperature, the solid solutions have non-zero entropy.

C Substance in solid phase has the least entropy.

D Entropy conservation takes place in all irreversible processes.

Answer: C

Question 133

If the COP of Carnot refrigerator is 4, then the thermal efficiency of the Carnot engine would be _____.

A 0.33

B 0.25

C 0.2

D 0.18

Answer: C

Question 134

While working between temperatures 150 K and 300 K, the entropy change experienced by the Carnot engine during heat addition is 1 kJ/K, the work produced (kJ) by the engine is _____.

A 100

B 150

C 300

D 600

Answer: B

Question 135

A heat engine working between the source at $200^{\circ}C$ and rejects heat at $25^{\circ}C$ receives 5 kW of heat. Work done for this engine is equal to 0 kW. Does this satisfy the inequality of Clausius?

A Yes

B No

C Cannot be determined

D None of these

Answer: A

Question 136

An ideal gas with heat capacity ratio of 2 is used in an ideal Otto-cycle which operates between minimum and maximum temperatures of 200 K and 1800 K. What is the compression ratio of the cycle for maximum work output?

A 1.5

B 2

C 3

D 4

Answer: C

Question 137

In an Otto cycle, air is compressed from 3 litres to 2.4 litres from a starting pressure of 1.5 kg/cm2. The net output per cycle is 400 kJ. What is the mean effective pressure (kPa) of the cycle?

A 500

B 567

C 667

D 700

Answer: C

Question 138

The combustion in a compression ignition engine is _____.

A heterogeneous

B homogeneous

C laminar

D turbulent

Answer: A

Question 139

Which relation is the basis of Mollier Diagram?

A $c_p = \left(\frac{\partial h}{\partial T}\right)_P$

B $c_v = \left(\frac{\partial Q}{\partial T}\right)_v$

C $c_p - c_v = R$

D $T = \left(\frac{\partial h}{\partial S}\right)_P$

Answer: D

Question 140

Which of the following formula holds TRUE for dryness fraction?

A $\frac{m_v}{m_v+m_l}$

B $\frac{m_l}{m_v+m_l}$

C $\frac{m_v+m_l}{m_v}$

D $\frac{m_v+m_l}{m_l}$

Answer: A

Question 141

Which gas will produce the highest efficiency in an ideal Otto cycle for same compression ratio?

A Air

B Carbon dioxide

C Helium

D Oxygen

Answer: C

Question 142

In Mollier diagram, the isotherm in the superheated region at low pressures becomes _____.

A diverge from one another

B horizontal

C parallel

D vertical

Answer: B

Question 143

If the heat rejected from the system is zero, then which of the following statements will hold TRUE?

A When net work is equal to the heat absorbed, work efficiency is 100%.

B Heat is exchanged from one heat reservoir only.

C It violates Kelvin-Plank statement.

D All options are correct

Answer: D

Question 144

Clausius' statement and Kelvin-Planck's statement are _____.

A not connected

B two parallel statements of the second law

C violation of one does not violates the other

D false statements

Answer: B

Question 145

For the same heat added and the same compression ratio, _____.

A Otto cycle is more efficient than diesel cycle.

B Diesel cycle is more efficient than Otto cycle.

C Both Diesel and Otto cycle are equally efficient.

D Cannot be determined.

Answer: A

Question 146

A reversible engine operates between temperature T_1 and T_2. The energy rejected by this engine acts as an input for another reversible engine at temperature T_2, which rejects to a reservoir at temperature T_3. What is the relation between T_1, T_2 and T_3?

A $T_2 = \frac{T_1+T_3}{2}$

B $T_2 = \sqrt{T_1^2 + T_3^2}$

C $T_2 = \sqrt{T_1 T_3}$

D $T_2 = \frac{T_1-T_3}{2}$

Answer: E

Question 147

Which equation defines the enthalpy (h) of a system?

A $U + \frac{pv}{J}$

B $U - \frac{pv}{J}$

C $U + \frac{R}{Jpv}$

D $U + Jpv$

Answer: A

Question 148

Which gas can attain the highest efficiency for the same compression rise?

A Any of the gases

B Diatomic gases

C Mono atomic gases

D Tri-atomic gases

Answer: C

Question 149

In Clausius theorem the reversible path is substituted by _____.

A reversible isobars

B reversible isotherms

C reversible isochoric

D None of these

Answer: B

Question 150

Which of the relation represents an irreversible and possible process?

A $\oint \frac{dQ}{T} = 0$

B $\oint \frac{dQ}{T} > 0$

C $\oint \frac{dQ}{T} < 0$

D None of these

Answer: C

Question 151

_____ does not certain tin as an alloying element.

A Babbitt metal

B White metal

C Solder

D All options are correct

Answer: D

Question 152

Under microscope ferrite appears as

A White

B Light

C Dark

D None of these

Answer: E

Question 153

_____ structure is obtained by austempering process of heat treatment.

A Sorbite

B Bainite

C Martensite

D Troostite

Answer: B

Question 154

Preheating is essential in welding

A high speed steel

B cast iron

C all non-ferrous materials

D None of these

Answer: B

Question 155

The melting point is the lowest for

A low carbon steel

B high carbon steel

C cast iron

D wrought iron

Answer: C

Question 156

_____ is commonly used for making household utensils.

A Duralumin

B Hindalium

C y-alloy

D Magnalium

Answer: B

Question 157

Ball bearings are generally made up of

A carbon steel

B carbon chrome steel

C stainless steel

D grey cast iron

Answer: B

Question 158

_____ has high tendency to get work hardened.

A Lead

B Aluminium

C Brass

D Silver

Answer: C

Question 159

_____ is the hardest known material

A Cemented carbide

B Ceramic

C Diamond

D Alloy steel

Answer: C

Question 160

_____ is obtained by isothermal hardening operation.

A Cementite

B Sorbite

C Acicular troostite

D Bainite

Answer: C

Question 161

Fluid is a substance which offers no resistance to change of

A pressure

B flow

C shape

D volume

Answer: C

Question 162

Density of water is maximum at

A $0°C$

B $0°K$

C $4°C$

D $100°C$

Answer: C

Question 163

A perfect gas

A has constant viscosity

B has zero viscosity

C is incompressible

D None of these

Answer: D

Question 164

A fluid in equilibrium can't sustain

A tensile stress

B compressive stress

C shear stress

D bending stress

Answer: C

Question 165

For manometer, a better liquid combination is one having

A higher surface tension

B lower surface tension

C surface tension is no criterion

D high density and viscosity

Answer: B

Question 166

The resultant upward pressure of the fluid on an immersed body is called

A upthrust

B buoyancy

C centre of pressure

D None of these

Answer: B

Question 167

$V = 0.0022t - \frac{1.8}{t}$ **is the equation to determine kinematic viscosity of liquids by**

A Redwood Viscometer

B Engler Viscometer

C Saybolt universal viscometer

D Newton Viscometer

Answer: C

Question 168

The capillary rise at 20 degree celsius in a clean glass tube of 1 mm bore containing water is approximately

A 3 mm

B 5 mm

C 10 mm

D 30 mm

Answer: D

Question 169

The rise or depression of liquid in a tube due to surface tension with increase in size of tube will

A increase

B remain unaffected

C may increase or decrease depending on the characteristics of liquid

D decrease

Answer: D

Question 170

In an isothermal atmosphere, the pressure

A decreases linearly with elevation

B remains constant

C varies in the same way as the density

D increases exponentially with elevation

Answer: C

Question 171

The magnitude of rise of pressure due to water hammer in a rigid and non-elastic pipe carrying water of density ρ and bulk modules k will be equal to

A] $\frac{k}{\sqrt{\rho}}$ **B]** $\sqrt{k\rho}$ **C]** $\sqrt{\frac{\rho}{k}}$ **D]** $\frac{k}{\rho}$

A A only

B B only

C C only

D D only

Answer: E

Question 172

The flow of any fluid, real or ideal, must fulfill the following

A Newton's law of viscosity

B Newton's second law of viscosity

C Velocity at boundary must be zero relative to the boundary

D the continuity equation

Answer: D

Question 173

The most economical section of circular channel for maximum discharge is obtained when (Where, d is the diameter of circular section)

A depth of water = 0.95 d

B wetter perimeter = 2.6 d

C hydraulic mean depth = 0.29 d

D Any one of these

Answer: A

Question 174

Borda's mouthpiece is

A a short cylindrical tube projecting inward, having length of $\frac{1}{2}$ diameter

B a convergent tube having length of 2 - 3 diameters

C most commonly used

D rarely used

Answer: A

Question 175

The critical velocity as

A maximum attainable velocity

B terminal velocity

C velocity when hydraulic jump occurs

D velocity above which the flow ceases to be streamlined

Answer: D

Question 176

Reynolds number for non-circular cross section is:
[V = mean velocity
v = kinematic viscosity
P = Ratio of cross sectional area to the wetter perimeter]
A] $\frac{V.4P}{v}$ **B]** $\frac{V.P}{v}$ **C]** $\frac{V.2P}{4v}$ **D]** $\frac{V.P}{4v}$

A A only

B B only

C C only

D D only

Answer: A

Question 177

In case of a two dimensional flow the components of velocity are given by u = ax; v = by, the streamlines will consist of a series of

A circular arcs

B parabolic arcs

C hyperbolic arcs

D elliptical arcs

Answer: C

Question 178

Friction factor of pipes depends on

A rate of flow

B fluid density

C viscosity

D All options are correct

Answer: D

Question 179

Time of flow from one tank in which water level is h_1 **to another tank having level** h_2 **will be proportional to**
A] $h_1 - h_1$ **B]** $\sqrt{h_1 - h_2}$ **C]** $\sqrt{h_1} - \sqrt{h_2}$ **D]** $h_1^{\frac{3}{2}} - h_2^{\frac{2}{3}}$

A Only A

B Only B

C Only C

D Only D

Answer: C

Question 180

Which of the following represents steady uniform flow?

A flow through an expanding tube at an increasing rate

B flow through an expanding tube at constant rate

C flow through a long pipe at decreasing rate

D flow through a long pipe at constant rate

Answer: D

Question 181

Chezy's equation is used to determine

A velocity of flow in open channel

B velocity of flow in pipe

C flow over weirs

D discharge through notch

Answer: A

Question 182

Bluff body is the body of such a shape that pressure drag as compared to friction drag is

A same

B more

C less

D zero

Answer: B

Question 183

For best hydraulic rectangular cross-section of an open channel, its depth should be equal to

A width

B two times the width

C half of the width

D three-eighth of the width

Answer: C

Question 184

The value of coefficient of velocity for a sharp edged orifice is of the order of

A 0.45

B 0.5

C 0.62

D None of these

Answer: D

Question 185

The discharge over a sharp-edged rectangular notch of width w depth h is equal to

A $\frac{2}{3}C_dw\sqrt{2g}h^{\frac{5}{2}}$

B $\frac{2}{3}C_dw\sqrt{2g}h$

C $\frac{2}{3}C_dw\sqrt{2g}h^{\frac{3}{2}}$

D $\frac{8}{15}C_dw\sqrt{2g}h^{\frac{3}{2}}$

Answer: C

Question 186

When a liquid rotates at constant angular velocity about a vertical axis as a rigid body, the pressure

A increases linearly as its radial distance

B varies inversely as the altitude along any vertical line

C varies as the square of the radial distance

D decreases as the square of the radial distance

Answer: C

Question 187

The discharge through a semi-circular weir is proportional

A $H^{\frac{-1}{2}}$

B $H^{\frac{1}{2}}$

C $H^{\frac{3}{2}}$

D None of these

Answer: C

Question 188

The rate of change of moment of momentum represents the

A force exerted by fluid

B torque applied by the fluid

C work done by the fluid

D power developed by the fluid

Answer: B

Question 189

Separation of flow occurs when pressure gradient

A tends to approach zero

B becomes negative

C reduces to a value when vapor formation starts

D None of these

Answer: D

Question 190

The ratio of actual discharge to theoretical discharge through an orifice is

A $\frac{C_c}{D_d}$

B $\frac{C_d}{C_v}$

C $\frac{C_v}{C_d}$

D C_cC_v

Answer: D

Question 191

Coke is produced by

A pulverizing coal in inert atmosphere

B heating wood in a limited supply of air at temperatures below $300^\circ C$

C strongly heating coal continuously for about 48 hours in the absence of air in a closed vessel

D binding the pulverized coal into briquettes

Answer: C

Question 192

One kg of steam sample contains 0.8 kg dry steam; it's dryness fraction is

A 0.2

B 0.8

C 0.6

D 0.5

Answer: B

Question 193

At which pressure (in kg/cm^2) the properties of water and steam become identical

A 0.1

B 1

C 100

D 225.6

Answer: D

Question 194

Cochran boiler is a

A horizontal fire-tube boiler

B horizontal water-tube boiler

C vertical water-tube boiler

D vertical fire tube boiler

Answer: D

Question 195

The diameter of tubes for natural circulation boiler as compared to controlled circulation boilers is

A more

B less

C same

D could be more or less depending on other factors

Answer: A

Question 196

Supercharging is the process of

A supplying the intake of an engine with air at a density greater than the density of the surrounding atmosphere

B providing forced cooling air

C injecting excess fuel for raising more load

D supplying compressed air to remove combustion products fully

Answer: A

Question 197

The accumulation of carbon in a cylinder results in increase of

A clearance volume

B volumetric efficiency

C ignition time

D effective compression ratio

Answer: D

Question 198

Which of the following is a false statement? Excess quantities of Sulphur in diesel fuel are objectionable because it may cause the following:

A piston ring and cylinder wear

B formation of hard coating on piston skirts

C oil sludge in the engine crank case

D detonation

Answer: D

Question 199

Installation of supercharger on a four-cycle diesel engine can result in the following percentage increase in power

A upto 25%

B upto 35%

C upto 50%

D None of these

Answer: D

Question 200

In order to prevent formation of carbon on the injector, the temperature (in $^{\circ}C$) of nozzle tip should be

A less than 100

B between 100 - 250

C between 250 - 300

D between 400 - 500

Answer: C