



SSC JE Mechanical Engineering 29th Jan 2018 Shift-1

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General Intelligence and Reasoning

Instructions

For the following questions answer them individually

Question 1

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

Smash : Badminton :: ? : ?

- A Board : Chess
- B Bowled : Cricket
- C Ball : Golf
- D Stick : Polo

Answer: B

Question 2

In the following question, select the related word pair from the given alternatives.

School : Student :: ? : ?

- A Hospital : Bed
- B Judge : Court
- C Shop : Selling
- D Prison : Convict

Answer: D

Question 3

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

Temperature : Degree :: Area : ?

- A Watt
- B Hectare
- C Kilogram
- D Ampere

Answer: B

Question 4

In the following question, select the related letter pair from the given alternatives.

LACK : GWXG :: MYST : ?

- A TCPH
- B HUNP
- C TUMC
- D HUMT

Answer: B

Question 5

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

PIT : UNY :: FAX : ?

- A LGB
- B KEB
- C KFC
- D LAE

Answer: C

Question 6

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

FK : CI :: GL : ?

- A AH
- B RV
- C KP
- D DJ

Answer: D

Question 7

In the following question, select the related number pair from the given alternatives.

45 : 90 :: ? : ?

- A 48 : 96
- B 24 : 50
- C 12 : 50
- D 31 : 63

Answer: A

Question 8

In the following question, select the related number from the given alternatives.

62 : 155 :: 74 : ?

- A 185
- B 165
- C 170
- D 190

Answer: A

Question 9

In the following question, select the related number from the given alternatives.

41 : 5 :: 23 : ?

- A 5
- B 3
- C 8
- D 9

Answer: A

Question 10

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

- A Sitar
- B Violin
- C Harmonium
- D Guitar

Answer: C

Question 11

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

- A Rice
- B Wheat
- C Maize
- D Potato

Answer: D

Question 12

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

- A Cuboid
- B Cone
- C Triangle
- D Cube

Answer: C

Question 13

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

- A NJFB

B KGCZ

C BXTF

D LHDZ

Answer: B

Question 14

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

A RLFZ

B KDXR

C PJDX

D TNHB

Answer: B

Question 15

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

A XAD

B ILO

C TWZ

D FIM

Answer: D

Question 16

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

A 13 - 5

B 15 - 7

C 12 - 6

D 14 - 6

Answer: C

Question 17

In the following question, select the odd number pair from the given alternatives.

A 93 - 97

B 84 - 88

C 54 - 58

D 29 - 35

Answer: D

Question 18

In the following question, select the odd number pair from the given alternatives.

- A 11 - 13
- B 17 - 19
- C 23 - 31
- D 31 - 37

Answer: C

Question 19

Arrange the given words in the sequence in which they occur in the dictionary.

1. Reality
2. Receptive
3. Rebound
4. Realism
5. Realize

- A 45132
- B 41532
- C 41523
- D 45123

Answer: B

Question 20

Arrange the given words in the sequence in which they occur in the dictionary.

1. Shapely
2. Shoddy
3. Shelve
4. Short
5. Sharp

- A 15234
- B 51234
- C 15324
- D 51324

Answer: C

Question 21

Arrange the given words in the sequence in which they occur in the dictionary.

1. Stern
2. Startle
3. Steep
4. Storm
5. Stick

- A 23451

B 23154

C 23145

D 23415

Answer: B

Question 22

A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.
APRQ, ZLQM, YHPI, XDOE, ?

A VXNZ

B WXOA

C VXMB

D WZNA

Answer: B

Question 23

A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.
RIM, UNT, XSA, AXH, ?

A CBM

B DCO

C DBN

D CCO

Answer: B

Question 24

A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.
FC, DA, BY, ZW, ?

A YU

B XU

C YV

D XV

Answer: B

Question 25

In the following question, select the missing number from the given alternatives.
14, 35, 87.5, ?, 546.875

A 218.75

B 262.5

C 192.75

D 178.5

Answer: A

Question 26

In the following question, select the missing number from the given alternatives..
43, 21.5, 21.5, 43, ?, 1376

A 172

B 138

C 124

D 194

Answer: A

Question 27

In the following question, select the missing number from the given alternatives.
81, 23, 104, 127, 231, ?

A 392

B 440

C 324

D 358

Answer: D

Question 28

E is taller than D, C is taller than E, A is taller than E and B is taller than C. Who is the second shortest?

A D

B E

C A

D C

Answer: B

Question 29

D's mother's father is C's father's father-in-law. How are C and D related if D is male and C female?

A D is C's wife's brother

B C is sister of D's wife

C D is C's brother

D C is mother of D's wife

Answer: C

Question 30

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

- A wheat
- B valet
- C halve
- D given

Answer: D

Question 31

If **MORTALS** is coded as **LNQSZKR**, then how will **BIN** be coded as?

- A YRM
- B AHM
- C DKP
- D CJO

Answer: B

Question 32

In a certain code language, **6532** means 'change the TV channel', **8965** means 'give back the change' and **1246** means 'channel the inner energy'. Find the code for 'channel'.

- A 3
- B 5
- C 6
- D 2

Answer: D

Question 33

In a certain code language, '+' represents '-', '-' represents '×', '×' represents '÷' and '÷' represents '+'. Find out the answer to the following question.

$$950 \times 50 + 8 - 5 \div 20 = ?$$

- A 4
- B 58
- C -32
- D -1

Answer: D

Question 34

If $7 @ 3 = 8$, $10 @ 2 = 16$ and $70 @ 40 = 60$, then find the value of $7 @ 5 = ?$

- A 35
- B 4
- C 2
- D 75

Answer: B

Question 35

If $A * B$ means A is mother of B, $A + B$ means A is sister of B and If $A \% B$ means A is daughter of B, then what does $G \% H * I + J$ mean?

- A G is sister of J
- B G is mother of J
- C G is daughter of J
- D G is sister of J's wife

Answer: A

Question 36

Select the missing number from the given responses

4	2	2
7	6	1
6	10	?

- A 3
- B 4
- C 1
- D -4

Answer: D

Question 37

Which of the following terms follows the trend of the given list?
 000X00, 0000X0, 00000X, X00000, 0X0000, _____.

- A 00X000
- B 0X0000
- C 000X00
- D 0000X0

Answer: A

Question 38

A women leaves her hut and walks 2 km West, then she turns North and walks 7 km, then she turns East and walks 1 km, then she turns South and walks 3 km, then she turns to her left and walks 1 km to reach the well. Where is this well with respect to her hut?

- A 4 km South
- B 10 km North
- C 10 km South
- D 4 km North

Answer: D

Question 39

Two siblings start from home to go to their respective schools. The brother goes 6 km West, then turns right and goes 3 km and reaches his school. The sister goes 2 km South, then 4 km East, then turns left and goes 5 km and reaches her school. Where is the sister's school with respect to the brother's school?

- A 10 km West
- B 10 km East
- C 2 km East
- D 2 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: No soldiers are french

Statement II: All europeans are french

Conclusion I: Some french are europeans

Conclusion II: Some soldiers are europeans

- 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: A

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 passes are valleys

Statement II: Some passes are mountains

Statement III: Some hills are mountains as well as valleys

Conclusion I: Some hills are passes

Conclusion II: Some mountains are valleys

Conclusion III: All valleys are hills

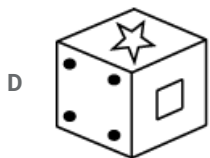
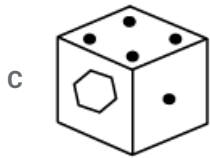
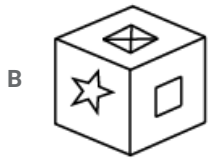
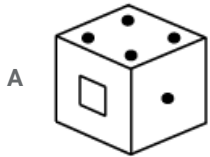
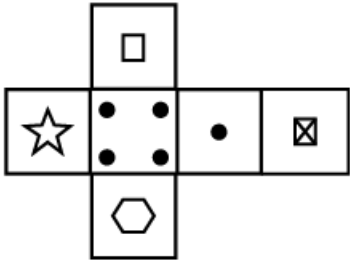
- A Only conclusion I follows

- B Only conclusion II follows
- C Only conclusions I and II follow
- D All conclusions I, II and III follow

Answer: B

Question 42

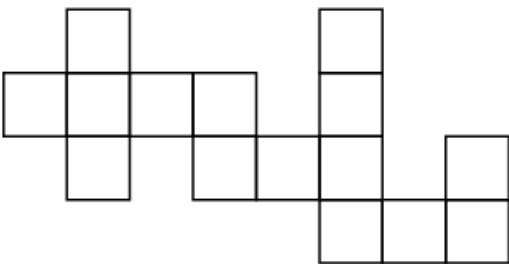
Which of the following cube in the answer figure cannot be made based on the unfolded cube in the question figure?

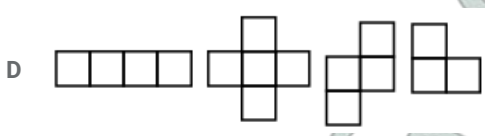
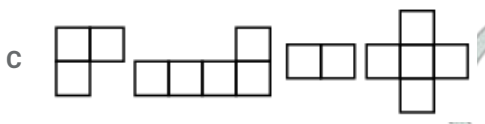
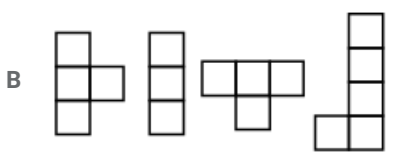
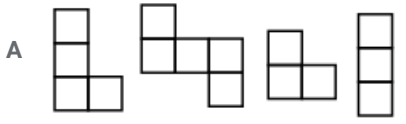


Answer: A

Question 43

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

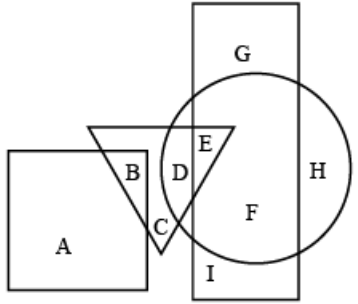




Answer: C

Question 44

In the following figure, square represents Dentists, triangle represents Collectors, circle represents Indians and rectangle represents Women. Which set of letters represents Indians who are either collectors or women?

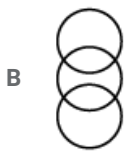


- A DEF
- B GFH
- C IEF
- D CDE

Answer: A

Question 45

Which of the following Venn diagrams represents the relationship between Gold, Silver and Gold coins?

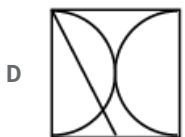
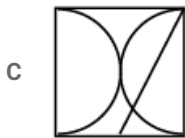
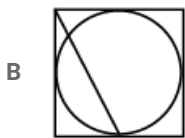
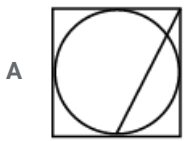
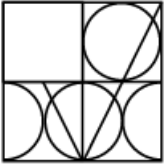




Answer: C

Question 46

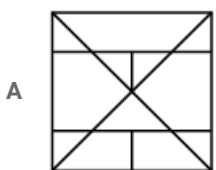
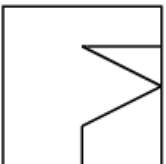
Which answer figure will complete the pattern in the question figure?

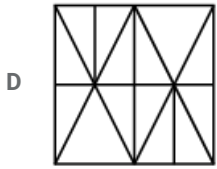
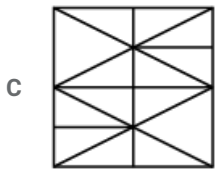
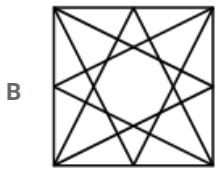


Answer: B

Question 47

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

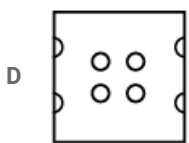
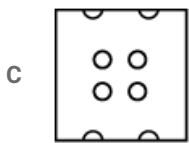
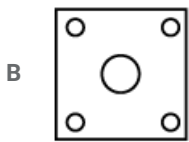
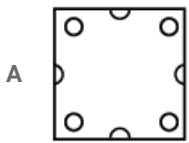
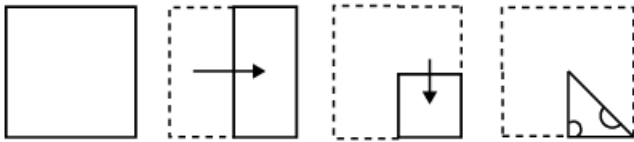




Answer: C

Question 48

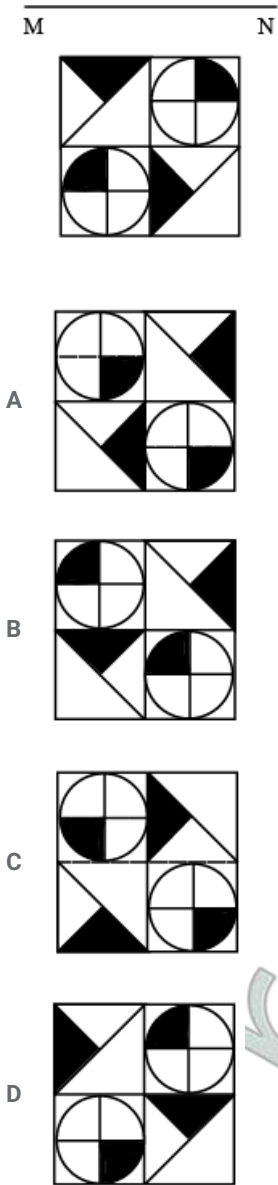
A piece of paper is folded and punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened.



Answer: A

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?



Answer: C

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 'E' can be represented by 41, 32 etc and 'U' can be represented by 95, 87 etc. Similarly, you have to identify the set for the word 'MAXI'.

Matrix I					
	0	1	2	3	4
0	G	M	M	K	G
1	K	A	J	I	C
2	M	I	F	B	H
3	M	L	E	H	G
4	K	E	M	K	G

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

A 02,34,67,89

B 01,56,32,98

C 30,11,96,13

D 34,76,43,01

Answer: C

General Awareness

Instructions

For the following questions answer them individually

Question 51

Which of the following is called a 'banker's cheque'?

A IPO

B DD

C FD

D RD

Answer: B

Question 52

The place where bankers meet and settle their mutual claims and accounts is known as

A Clearing House

B Treasury

C Cheque Scanning

D No option is correct.

Answer: A

Question 53

Which among the following formulates fiscal policy?

A RBI

B SEBI

C IRDA

D Finance Ministry

Answer: D

Question 54

The Zero Base Budgeting in India was first experimented from which year?

A 1984

B 1985

C 1987

D 1989

Answer: C

Question 55

In economic terms, which of the following factors determine the 'Individual's demand' of a product/commodity?

A Price of a commodity

B Income of the consumer

C Taste and Preference of consumer

D All options are correct.

Answer: D

Question 56

Who among the following was never the Lok Sabha Speaker?

A Meira Kumar

B Balram Jakhar

C Chandrashekhar

D GMC Balyogi

Answer: C

Question 57

On whose advice does the President of India appoint a state governor?

A Chief Justice of India

B Chief Minister of the State

C Prime Minister of India

D Vice President of India

Answer: C

Question 58

The concept of Public Interest Litigation originated in which of the following countries?

A England

B USA

C Russia

D China

Answer: B

Question 59

Who among the following decides whether a particular bill is a Money Bill or not?

- A Finance Minister
- B President of India
- C Loksabha Speaker
- D Vice President of India

Answer: C

Question 60

Which of the following States sends the maximum number of members to the Rajya Sabha?

- A Uttar Pradesh
- B Rajasthan
- C Maharashtra
- D Madhya Pradesh

Answer: A

Question 61

Chandella Kings are related to which of the following temples?

- A Khajuraho
- B Tirupati
- C Rameshwaram
- D Badrinath

Answer: A

Question 62

In which language did most Buddhist texts were written?

- A Sanskrit
- B Magadhi
- C Prakrit
- D Pali

Answer: D

Question 63

Who established the "Atmiya Sabha" a precursor organization in the socio-religious reforms in Bengal?

- A Tulsidas
- B Malik Muhammad Jayasi
- C Surdas

D Kabirdas

Answer: B

Question 64

Who was the first Indian to get selected in ICS?

A Dadabhai Naorojee

B Subhash Chand Bose

C Ravindra Nath Tagore

D Satyendra Nath Tagore

Answer: D

Question 65

Who established the "Atmiya Sabha" a precursor in the socio-religious reforms in Bengal?

A Vivekanand

B Dayanand Saraswati

C Raja Ram Mohan Roy

D Arbindo

Answer: C

Question 66

In which State is the Guru Shikhar Peak located?

A Tamil Nadu

B Rajsthan

C Himachal Pradesh

D Andhra Pradesh

Answer: B

Question 67

Through which of the following countries does the Tropic of Capricorn pass?

A Australia

B Brazil

C Chile

D All options are correct.

Answer: D

Question 68

Which among the following countries has the world's largest reserves of Uranium?

- A Russia
- B Kazakhstan
- C Australia
- D Jordan

Answer: C

Question 69

What is the new name of Jog or Gerosoppa waterfall?

- A Mahatma Gandhi Waterfall
- B Jawaharlal Nehru Waterfall
- C Sardar Patel Waterfall
- D Rajiv Gandhi Waterfall

Answer: A

Question 70

Which one of the following states receives the highest rainfall during winter months?

- A Mizoram
- B Uttarakhand
- C Tamil Nadu
- D Bihar

Answer: C

Question 71

Which state passed a bill awarding death penalty to those found guilty of raping minors in December, 2017?

- A Punjab
- B Madhya Pradesh
- C Haryana
- D Uttar Pradesh

Answer: B

Question 72

Union Government has framed a scheme for setting up how many special courts to fast track criminal cases against tainted MP and MLA leaders?

- A 10
- B 11
- C 12

D 13

Answer: C

Question 73

India's Manushi Chhillar won the coveted Miss World 2017 crown. Where was held it?

A China

B France

C India

D Canada

Answer: A

Question 74

Which of the following countries hosted a world chess tournament for the first time in year 2017?

A Norway

B Armenia

C Azerbaijan

D Saudi Arabia

Answer: D

Question 75

India won the first-ever South Asian Regional Badminton Team Championship. India defeated which of the following team?

A Pakistan

B Bhutan

C Nepal

D Bangladesh

Answer: C

Question 76

"Non-Stop India" is written by _____.

A Sudha Murthy

B Dalai Lama

C Mark Tully

D Chetan Bhagat

Answer: C

Question 77

Which musical artist won the Indira Gandhi Award for National Integration in October 2017?

- A T. M. Krishna
- B M. S. Subbulakshmi
- C A. R. Rahman
- D All options are correct.

Answer: A

Question 78

'Festival of India' was organized in which country from 31 August to 9 September 2017?

- A Italy
- B London
- C Brazil
- D New York

Answer: C

Question 79

Which of the following agreement has been signed between India and Israel in July 2017?

- A Agreement for transfer of sentenced person
- B MoU on cooperation in organ transplantation
- C Agreement on technology in civil aviation
- D MoU on state water utility reform in India

Answer: D

Question 80

Which of the following operation was launched by Indian government to help Rohingya refugees in Bangladesh?

- A Manavta
- B Insaniyat
- C Mother
- D Pahel

Answer: B

Question 81

Servers are computers that provide resources which are connected to a _____.

- A client
- B network
- C supercomputer

D mainframe

Answer: B

Question 82

Which of the following is a binary number?

A 100101

B 2341

C 101C11

D 5F6034

Answer: A

Question 83

Which alloy is made of essentially copper and tin?

A Brass

B Bronze

C Solder

D Ranga

Answer: B

Question 84

Incomplete combustion of a fuel gives poisonous _____ gas.

A carbon dioxide

B isocyanate

C Carbon monoxide

D nitrogen

Answer: C

Question 85

What is value of pH of a neutral solution?

A 7.0

B 6.5

C 7.5

D 6.0

Answer: A

Question 86

Which base is generally found in soaps?

- A Calcium hydroxide
- B Ammonium hydroxide
- C Sodium hydroxide
- D Magnesium hydroxide

Answer: C

Question 87

Which type of image is always formed by a convex mirror?

- I. Real
- II. Virtual
- III. Enlarged

- A Only I
- B Only II
- C Only I and III
- D Only II and III

Answer: B

Question 88

There is a circular coil having n turns. The field produced is how many times larger than produced by a coil of single turn?

- A n
- B n^2
- C $\frac{n}{2}$
- D $\frac{n^2}{2}$

Answer: A

Question 89

Which of the following is NOT an example of a biomass energy source?

- A Wood
- B Gobar gas
- C Atomic energy
- D Coal

Answer: C

Question 90

Density of water _____ when it freezes.

- A decreases
- B increases

- C remain constant
- D No option is correct.

Answer: A

Question 91

Which human organ gets majorly affected due to Vitamin D deficiency?

- A Eyes
- B Skin
- C Hair
- D Bone

Answer: D

Question 92

Match the structures given in column (A) with the functions given in column (B).

Column - A	Column - B
I. Stomata	1. Absorption of water
II. Xylem	2. Transpiration
III. Root hairs	3. Transport of food
IV. Phloem	4. Transport of water
	5. Synthesis of carbohydrates

- A I-1, II-2, III-3, IV-4
- B I-2, II-4, III-1, IV-3
- C I-1, II-2, III-4, IV-3
- D I-1, II-3, III-2, IV-4

Answer: B

Question 93

What is called the process of fusion of the male and the female gametes?

- A Fertilisation
- B Pollination
- C Reproduction
- D Seed formation

Answer: A

Question 94

Which of the following is in monera group?

- A Mushrooms
- B Yeast

C Bacteria

D Moss

Answer: C

Question 95

Eyes must be removed within _____ hours after the death for eye donation.

A 6

B 8

C 12

D 24

Answer: A

Question 96

Which of the following is/are agent(s) of infection?

A Physical contact

B Vectors

C Water

D All options are correct.

Answer: D

Question 97

Which of the following is NOT a forest product?

A Gum

B Plywood

C Sealing wax

D Kerosene

Answer: D

Question 98

According to World Wide Fund, which of the following river of India is one of the ten most endangered rivers in the world?

A River Jamuna

B River Ganges

C River Brahmaputra

D River Godavari

Answer: B

Question 99

Montreal Protocol is related to which of the following?

- A E-waste
- B Ozone layer
- C Water pollution
- D No option is correct.

Answer: B

Question 100

Mission of Ramsar Convention is to conserve _____.

- A wetland
- B rivers
- C oceans
- D deserts

Answer: A

General Engineering (Mechanical)

Instructions

For the following questions answer them individually

Question 101

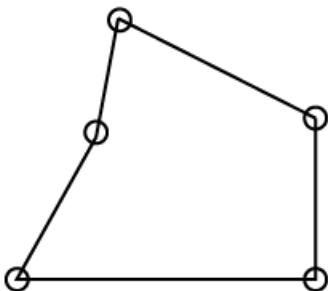
Which of the following is the type of completely constrained motion?

- A Shaft with collars in a circular hole
- B Shaft in a foot step bearing
- C Square bar in square hole
- D Both Shaft with collars in a circular hole and Shaft in a foot step bearing

Answer: B

Question 102

Which of the following condition is TRUE about the given figure ?



- A Constrained kinematic chain

B Unconstrained kinematic chain

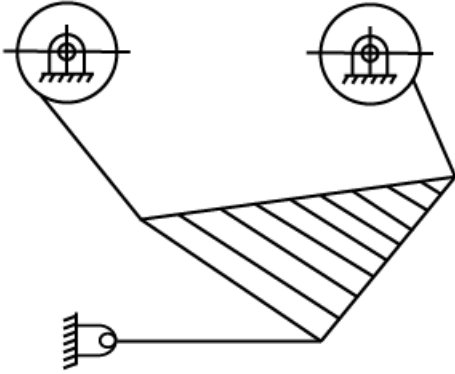
C Locked chain

D Mechanism

Answer: B

Question 103

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



A 0

B 1

C 2

D 3

Answer: C

Question 104

A quaternary joint in the kinematic chain is equivalent to _____

A two binary joints

B four binary joints

C one binary joint

D three binary joints

Answer: D

Question 105

During a cycle of the flywheel having I as mass moment of inertia, ω_{av} as the average rotational speed and K_{es} is the coefficient of fluctuation of speed. The maximum fluctuation of energy E_t is ____.

A $\frac{1}{2} I \omega_{av} (\omega_{max} - \omega_{min})$

B $I (\omega_{max}^2 - \omega_{min}^2)$

C $\frac{1}{2} I K_{es} \omega_{av}^2$

D $I K_{es} \omega_{av}^2$

Answer: D

Question 106

Determine the ratio of $\frac{w_{max}}{w_{min}^2}$ if the coefficient of speed fluctuation of a flywheel is C_t .

- A $\frac{1-2C_f}{1+2C_f}$
- B $\frac{1+2C_f}{1-2C_f}$
- C $\frac{1+C_f}{1-C_f}$
- D $\frac{2+C_f}{2-C_f}$

Answer: D

Question 107

Oldham's coupling is the inversion of _____.

- A four bar link chain
- B double slider crank chain
- C single slider crank mechanism
- D None of these

Answer: B

Question 108

In the slider crank chain, the formation of Whitworth quick return mechanism takes place when _____.

- A coupler link is fixed
- B longest link is a fixed link
- C smallest link is fixed
- D slider is a fixed link

Answer: C

Question 109

A Hartnell governor comes under which type of governor?

- A Pendulum type
- B Inertia type
- C Centrifugal type
- D Dead weight type

Answer: C

Question 110

What is the location of the frictional force, when the intensity of pressure is uniform in a flat pivot bearing having radius r ?

- A r
- B $\frac{r}{2}$
- C $\frac{2r}{3}$
- D $\frac{r}{3}$

Answer: C

Question 111

The moment of inertia of a flywheel is 19.6 kgm^2 and it fluctuates at the speed of 40 rpm for the fluctuation in energy of 2036 joules. What is the mean speed of the flywheel (rad/s)?

- A 24.79
- B 25
- C 27
- D 30

Answer: A

Question 112

The ratio of the tension in the tight side (T_a : and tension on the slack side of the belt (T_b : of the belt is 5.0. What is the power transmitted(kW) by a belt, if the tension on the tight side of the belt is 5000 N and the velocity of belt is 25.00 m/sec?

- A 50
- B 75
- C 100
- D 150

Answer: C

Question 113

What is the total number of inversion possible for the slider crank mechanism?

- A 5
- B 6
- C 4
- D 3

Answer: C

Question 114

A solid disc type flywheel has the diameter D , what is the radius of gyration of the solid disk type?

- A D
- B $\frac{D}{2}$

C $\frac{D}{2\sqrt{2}}$

D $\frac{2}{D}$

Answer: C

Question 115

The correct option for the occurrence of the total slip in a belt drive occurs when _____.

- A angle of creep is zero
- B angle of rest is zero
- C angle of creep is greater than angle of rest
- D angle of rest is greater than angle of creep

Answer: B

Question 116

The point of application of the resultant of all the forces which tends to cause rotation in the body about a certain axis is known as _____.

- A center of gravity
- B the point of metacentre
- C point of suspension
- D center of percussion

Answer: D

Question 117

The centre of gravity of a triangle is located at the point of _____.

- A intersection of its altitudes
- B intersection of bisector of angles
- C intersection of diagonals
- D concurrence of the medians

Answer: D

Question 118

The coefficient of friction depends on which of the following factors?

- A Shape of surfaces.
- B Strength of surfaces.
- C Nature of surface.
- D All option are correct

Answer: C

Question 119

The angle between normal reaction and the resultant of normal reaction and the limiting friction is known as _____.

- A angle of repose
- B angle of friction
- C angle of contact
- D None of these

Answer: B

Question 120

The value of Poisson's ratio depends on _____.

- A material of the test specimen
- B magnitude of the load
- C cross section
- D None of these

Answer: A

Question 121

The equivalent length of the column when one end is fixed and the other end is pinned is _____.

- A l
- B $\frac{l}{2}$
- C $\frac{l}{\sqrt{2}}$
- D $2l$

Answer: C

Question 122

Poisson's ratio is defined as the ratio of _____.

- A longitudinal strain to lateral strain
- B original length to final length
- C lateral strain to longitudinal strain
- D None of these

Answer: C

Question 123

Which of the following shows the correct relation between shear force (V_x), bending moment (M_x) and load (W) ?

- A $\frac{d^2V_x}{dx^2} = -W$

B $\frac{dV_x}{dx} = -W$

C $\frac{dM_x}{dx} = V_x$

D Both $\frac{dV_x}{dx} = -W$ and $\frac{dM_x}{dx} = V_x$

Answer: D

Question 124

What is the ratio of the Euler's buckling load of column having (i) both ends fixed and (ii) one end fixed and other pinned?

A 4:1

B 16:1

C 1:4

D 2:1

Answer: D

Question 125

Consider the following relation for the torsional stiffness (K_T)

(1) $k_T = \frac{T}{\theta}$

(2) $k_T = \frac{GJ}{L}$

(3) $k_T = \frac{G\theta}{L}$

Which of the following option is correct.

A (1), (2) and (3)

B Only (1) and (3)

C Only (1) and (2)

D Only (2) and (3)

Answer: C

Question 126

Determine the change in volume (in cm^3) of a block of length 15 cm, width 10 cm and height 8 cm, undergoes a volumetric strain of $\frac{1}{2500}$

A 0.004

B 0.0004

C 0.48

D 0.048

Answer: C

Question 127

What is the shape of the shearing stress distribution across a rectangular cross section beam?

A Parabolic

- B Rectangular
- C Triangular
- D Both Rectangular and parabolic shape

Answer: A

Question 128

Which of the following conditions is TRUE for the shafts connected in series to each other?

- A $\theta_1 = \theta_2$
- B $T = T_1 + T_2$
- C $\theta = \theta_1 + \theta_2$
- D $\theta_1 = \theta_2$ and $T = T_1 + T_2$

Answer: C

Question 129

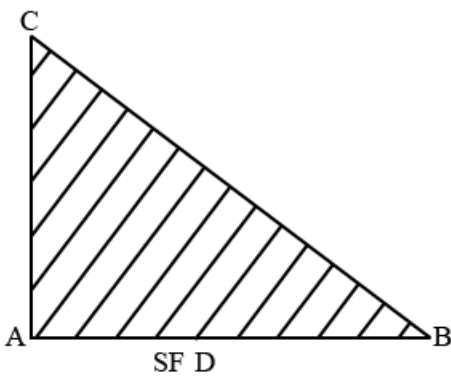
A rod of dimension 20 mm x 20 mm is carrying an axial tensile load of 10 kN. If the modulus of elasticity is 250 Mpa, then the strain induced due to this load would be _____.

- A 0.1
- B 0.25
- C 0.2
- D 10

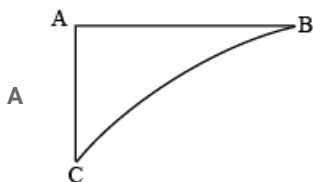
Answer: A

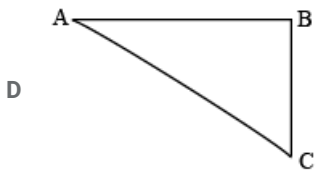
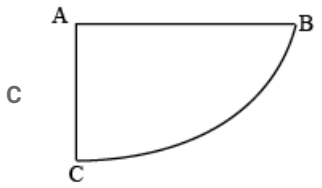
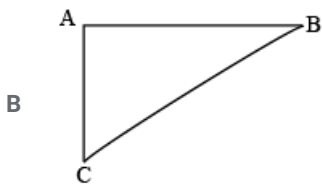
Question 130

The diagram shown below shows the shearing force diagram for a beam.



Which of the following is the CORRECT bending moment diagram for the above shear force diagram ?





Answer: A

Question 131

Which term clearly defines the degree of sub cooling?

- A The temperature difference between saturated liquid and actual temperature of liquid.
- B The temperature difference between saturated vapour and actual temperature of liquid.
- C The temperature difference between saturated liquid and actual temperature of vapour.
- D The temperature difference between saturated vapour and actual temperature of vapour.

Answer: A

Question 132

The property of a working system which changes as the heat is supplied to the working fluid in a reversible manner is known as _____.

- A entropy
- B enthalpy
- C external energy
- D internal energy

Answer: A

Question 133

Which of the following statements hold TRUE for the first law of thermodynamics?

- A The entropy of the system remains constant.
- B The total energy of the system remains constant.
- C The total internal energy of the system remains constant.
- D Work done by the system is equal to the heat transferred by the system.

Answer: B

Question 134

Two heat engines operating between temperatures 2000 K and T K and T K and 500 K respectively. What is the intermediate temperature, if the efficiency of both the cycles is same?

- A 900 K
- B 1000 K
- C 1500 K
- D 1600 K

Answer: B

Question 135

A Carnot heat pump is working with an efficiency of 50%. If the cycle is converted into a heat pump after reversing, then what is the coefficient of performance of the heat pump?

- A 1
- B 1.67
- C 2
- D 2.5

Answer: C

Question 136

Which of the following sequence is TRUE for same compression ratio and added heat?

- A $\eta_{diesel} > \eta_{Otto}$
- B $\eta_{diesel} < \eta_{Otto}$
- C $\eta_{diesel} = \eta_{Otto}$
- D None of these.

Answer: B

Question 137

The thermal efficiency of a diesel engine lies in the range of _____.

- A 30%-35%
- B 45%-50%
- C 60%-65%
- D 70%-75%

Answer: B

Question 138

What is the other name of dual cycle?

- A Joule cycle
- B Otto cycle
- C Diesel cycle
- D Mixed cycle

Answer: D

Question 139

How the heat addition in dual cycle takes place?

- A At constant volume.
- B At constant pressure
- C First at constant pressure and then at constant volume.
- D First at constant volume and then at constant pressure.

Answer: D

Question 140

For which type of engine Carnot cycle has the maximum efficiency?

- A Irreversible engine
- B Reversible engine
- C Petrol engine
- D Diesel engine

Answer: B

Question 141

Which cycle is mostly used in high compression engines?

- A Diesel cycle
- B Dual cycle
- C Otto cycle
- D Joule cycle

Answer: A

Question 142

An inventor says, he has invented an engine which will reject 20% of heat absorbed from the source and the engine operates between 2000 K and 500 K. What kind of engine it is?

- A Carnot engine
- B Diesel engine
- C Dual engine

D Impossible engine

Answer: D

Question 143

At what cut-off does the efficiency of Diesel cycle approaches that of Otto cycle?

A 0

B $\frac{1}{5}$

C $\frac{1}{4}$

D 2

Answer: A

Question 144

In a cyclic process, the work done by the system is 20 kJ, 30 kJ, 5 kJ and 10 kJ. What is the net heat (kJ) for the cyclic process?

A -5

B 0

C 5

D 10

Answer: A

Question 145

The heat rejection takes place in Carnot cycle at _____.

A isentropic compression

B isentropic expansion

C isothermal compression

D isothermal expansion

Answer: C

Question 146

What is the resultant of sum of product of pressure and volume (PV) with internal energy U known as?

A Enthalpy

B Entropy

C Specific heat

D Work-done

Answer: A

Question 147

What is the value of $\int \delta Q - \int \delta W$ for a process ?

- A Negative
- B Positive
- C Unpredictable
- D Zero

Answer: C

Question 148

If the efficiency of a Carnot engine is 40%, then the COP of the Carnot refrigerator will be _____.

- A 1
- B 1.5
- C 2.5
- D 3

Answer: B

Question 149

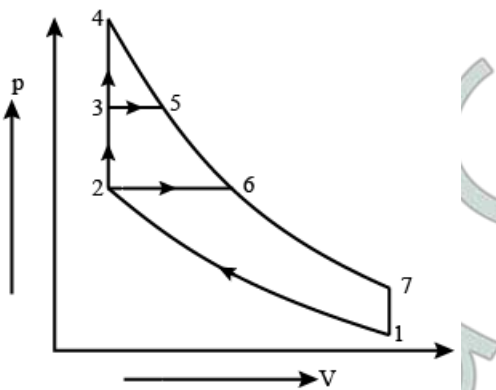
The triple point on a T-s diagram is _____.

- A a line
- B a point
- C a triangle
- D not present

Answer: A

Question 150

Which denoted path is followed by the dual cycle in the below $p - V$ diagram ?



- A 1-2-4-7-1
- B 1-2-3-5-7-1
- C 1-2-6-7-1
- D None of these

Answer: B

Question 151

What is the product of cupola called?

- A Wrought iron
- B Cast iron
- C Mild steel
- D Pig iron

Answer: B

Question 152

Gold is _____ material

- A ferroelectric
- B ferromagnetic
- C diamagnetic
- D paramagnetic

Answer: C

Question 153

_____ steel is widely used for rails of a railway track.

- A Mild
- B High carbon
- C Silicon
- D Nickel

Answer: B

Question 154

The important factor to be considered while selecting a bearing is

- A applied load
- B operating speed range
- C required bearing capacity
- D All option are correct

Answer: D

Question 155

Which one of the following methods is generally not used in welding of chromium molybdenum steels?

- A Oxyacetylene
- B Submerged arc
- C Thermite
- D Resistance

Answer: D

Question 156

Which bond is commonly used in grinding wheel

- A vitrified bond
- B silicate bond
- C shellac bond
- D resinoid bond

Answer: A

Question 157

Boring can be performed by

- A boring machines only
- B boring machines and lathe
- C a machine only by single point high speed carbide tools
- D boring machine, lathe and milling machine

Answer: D

Question 158

The amount of stock which can be removed by honing is

- A 0.75 mm
- B 0.05 mm
- C 0.02 mm
- D 0.015 mm

Answer: A

Question 159

Which of the following is not a gear finishing process?

- A Gear hobbing
- B Gear shaving
- C Gear lapping

D Gear grinding

Answer: A

Question 160

What is 'burr'?

A Built up edge on a cutting tool

B A cutting tool

C Burnt sand

D Sharp edge remaining on metal after cutting, stamping and machining

Answer: D

Question 161

Calorific value of a fuel is based on

A 1 kg of fuel

B $1 \frac{kg}{m^3}$ of fuel

C $1 m^3$ of fuel

D its specific volume

Answer: E

Question 162

The mechanical equivalent of heat 'J' is equal to

A 4.1868 kg/kcal

B 41.8 kg/kcal

C 4.1868 kcal/kg

D 4.1868 kJ

Answer: D

Question 163

In a closed system

A energy transfers from surrounding to system

B energy transfers from system to surrounding

C energy transfers from system to surrounding and vice-versa

D energy as well as mass cross the boundaries

Answer: C

Question 164

In isopiestic process, the

- A temperature remains constant
- B volume remains constant
- C $p \times V = \text{constant}$
- D pressure remains constant

Answer: D

Question 165

Charle's law states

- A $p_1 V_1 = p_2 V_2$
- B $\frac{p_1}{T_1} = \frac{p_2}{T_2}$
- C $\frac{p_1}{V_1} = \frac{p_2}{V_2}$
- D $\frac{V_1}{T_1} = \frac{V_2}{T_2}$

Answer: D

Question 166

Specific volume of a gas is the volume of

- A gas at NTP
- B unit mass of that gas
- C total amount of gas at some stated temperature and pressure
- D gas at -273°C

Answer: B

Question 167

The diesel oil is obtained during distillation process between the temperature limits.

- A 100°C to 200°C
- B 200°C to 300°C
- C 360°C to 475°C
- D 500°C to 675°C

Answer: C

Question 168

Which one of the following statements is correct when saturation pressure of water vapour increases?

- A Saturation temperature decreases
- B Enthalpy of evaporation decreases

- C Enthalpy of evaporation increases
- D Specific volume change of phase increases

Answer: B

Question 169

An insulated box containing 0.5kg of a gas having $C_v = 0.98$ kJ/kg-K falls from a balloon 4 km above the earth's surface. The temperature rise of the gas when the box hits the ground is

- A 0
- B 20K
- C 40K
- D 60K

Answer: C

Question 170

Molal specific heats of an ideal gas depend on

- A its pressure
- B its temperature
- C both its pressure and temperature
- D number of atoms in a molecule

Answer: D

Question 171

The Ratio of inertia force to elastic force is known as

- A Weber Number
- B Reynold's Number
- C Mach Number
- D Froude Number

Answer: C

Question 172

For handling non-Viscous liquids, oils and chemicals we use

- A open type impeller centrifugal pump,
- B axial flow pump
- C mixed flow pump
- D closed type impeller centrifugal pump

Answer: D

Question 173

The body is said to be floating when (Where, W Weight of the body and F_b = Buoyant force)

- A $W > F_b$
- B $W = F_b$
- C $W < F_b$
- D None of these

Answer: B

Question 174

A submerged body will be in stable equilibrium if the centre of gravity is

- A below the centre of buoyancy
- B above the centre of buoyancy
- C coinciding with the centre of buoyancy
- D None of these

Answer: A

Question 175

The discharge over the rectangular weir is equal to:

- (a) $3Cd\sqrt{2g}LH^{\frac{3}{2}}$
- (b) $2Cd\sqrt{2g}LH^{\frac{3}{2}}$
- (c) $2Cd\sqrt{2g}LH^{\frac{2}{3}}$
- (d) $3Cd\sqrt{2g}LH^{\frac{2}{3}}$

- A (a)
- B (b)
- C (c)
- D (d)

Answer: A

Question 176

The viscosity of liquid _____ with increase in temperature.

- A decreases
- B increases
- C first decreases then increases
- D None of these

Answer: A

Question 177

The pressure _____ as the depth of the liquid increases.

- A increases
- B decreases
- C remains unchanged
- D None of these

Answer: A

Question 178

The stability of a floating body depends upon

- A its volume
- B its weight
- C its metacentric height
- D the specific weight of fluid

Answer: C

Question 179

In order, to avoid separation in venturimeter the angle of divergence is kept

- A 10° to 15°
- B 15° to 20°
- C 5° to 7°
- D 7° to 10°

Answer: C

Question 180

The head lost due to turbulence flow as compared to head lost in laminar flow is

- A 100 times
- B 200 times
- C 320 times
- D 480 times

Answer: C

Question 181

If the flow parameters change with time it is known as

- A uniform flow

- B unsteady flow
- C steady flow
- D None of these

Answer: B

Question 182

The coefficient of lift at stall point is

- A maximum
- B minimum
- C zero
- D average

Answer: A

Question 183

Hydraulic jump is a phenomenon occurring in

- A a pipe
- B a closed channel
- C an open channel
- D None of these

Answer: C

Question 184

Pelton wheel is a

- A tangential flow turbine
- B radial flow turbine
- C axial flow turbine
- D None of these

Answer: A

Question 185

The unit speed of a turbine is equal to

- (a) $\frac{N}{\sqrt{H}}$
- (b) $\frac{\sqrt{H}}{N}$
- (c) $N\sqrt{H}$
- (d) $\frac{2N}{\sqrt{H}}$

- A (a)
- B (b)

C (c)

D (d)

Answer: A

Question 186

The flow within the boundary layer is

A only laminar

B only turbulent

C Either laminar or turbulent

D None of these

Answer: C

Question 187

Consider the following statements regarding Bernoulli's theorem for fluid flow

1. Conservation of energy

2. Steady flow

3. Viscous flow

4. Incompressible flow

Which of the above statements is/are correct?

A 1, 2 and 4

B Only 1

C 2, 3 and 4

D 1, 2, 3 and 4

Answer: A

Question 188

Why is an air vessel used in a reciprocating pump?

A To obtain a continuous supply of water at uniform rate

B To reduce suction head

C To increase the delivery head

D To reduce cavitation

Answer: A

Question 189

Consider the following statements pertaining to specific speed of turbo machines:

1. Specific speed varies with shape of the runner and other parts of the machine.

2. Machines with higher specific speeds are limited to low heads.

3. Specific speed is dimensionless .and is independent of variation of type of fluid used.

Which of the statements given above are correct?

A 1, 2 and 3

B 1 and 2

C 2 and 3

D 1 and 3

Answer: B

Question 190

The velocity of a water stream is being measured by a L- Shaped pitot-tube and the readings is 20 cm. Then, what is the approximate value of velocity?

A 196 m/s

B 2 m/s

C 98 m/s

D 20 m/s

Answer: B

Question 191

Which of the following water turbines maintain a high efficiency over a long range of the, part load?

1. Francis turbine
2. Kaplan turbine
3. Pelton turbine
4. Propeller turbine

A 1 and 4

B 2 and 3

C 1, 2 and 3

D 2, 3 and 4

Answer: B

Question 192

The components of velocity in a two-dimensional frictionless incompressible, flow are:

$u = t^2 + 3y$ and $v = 3t + 3x$ What is the approximate resultant total acceleration at the point (3, b: and t = 2?

A 5

B 49

C 59

D 54

Answer: C

Question 193

A centrifugal pump needs 1000 W of power when operating at 1500 rpm. What is the power requirement if, the speed of the pump is increased to 3000 rpm?

A 2000 W

- B 4000 W
- C 6500 W
- D 8000 W

Answer: D

Question 194

The flow in which conditions do not change with time at any point, is known as

- A one dimensional flow
- B uniform flow
- C steady flow
- D turbulent flow

Answer: C

Question 195

Uniform flow occurs when

- A the direction and magnitude of the velocity at all points are identical
- B the velocity of successive fluid particles, at any point, is the same at successive periods of time
- C the magnitude and direction of the velocity do not change from point to point in the fluid
- D the fluid particles move in plane or parallel planes and the streamline patterns are identical in each plane

Answer: C

Question 196

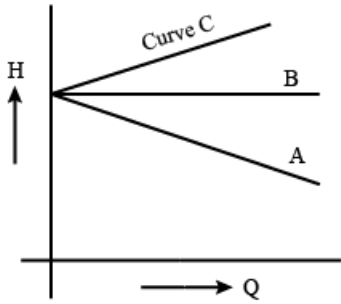
In a centrifugal pump casing, the flow of water leaving the impeller, is

- A rectilinear flow
- B radial flow
- C free vortex motion
- D forced vortex

Answer: C

Question 197

The given figure below shows the curves between Head (H) and Flow (Q) for centrifugal pump impeller with different impeller vane exit angles

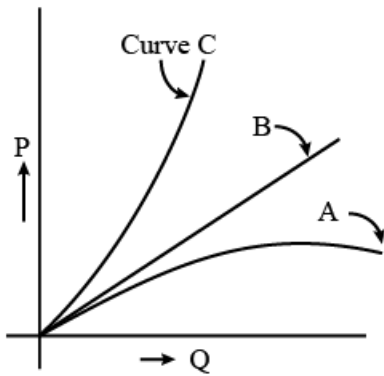


- A curve A
- B curve B
- C curve C
- D None of these

Answer: B

Question 198

The figure given below shows the relationship between power (P) and discharge (Q) for different vane exit angles of centrifugal pump. Curve A holds good for.



- A vane exit angle of 90°
- B vane exit angle of less than 90°
- C vane exit angle of more than 90°
- D any vane exit angle

Answer: B

Question 199

Specific speed of turbine indicated as

- A) $\frac{N\sqrt{Q}}{H^4}$
- B) $\frac{N\sqrt{P}}{H^4}$
- C) $\frac{N\sqrt{Q}}{H^3}$
- D) $\frac{N\sqrt{P}}{H^2}$

A A

B B

C C

D D

Answer: B

Question 200

If α is the angle of blade tip at outlet, then maximum hydraulic efficiency of an impulse turbine is

- A) $\frac{(1+\cos \alpha)}{2}$
- B) $\frac{(1-\cos \alpha)}{2}$
- C) $\frac{(1-\sin \alpha)}{2}$
- D) $\frac{(1+\sin \alpha)}{2}$

Answer: A