



SSC JE Mechanical Engineering 25th May 2014 Shift-2

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General Intelligence and Reasoning

Instructions

In the following questions, select the related word/letters/numbers from the given alternatives.

Question 1

Uttarakhand : Dehradun :: Mizoram : ?

- A Aizawl
- B Kohima
- C Shillong
- D Darjeeling

Answer: A

Explanation:

Dehradun is the capital of the Uttarakhand similarly Aizawl is the capital of the Mizoram.

∴ Option A is the correct answer.

Question 2

Crime : Court :: Disease : ?

- A Doctor
- B Medicine
- C Hospital
- D Treatment

Answer: C

Explanation:

As crime is related to court similarly, disease is related to hospital.

∴ The correct answer is option C.

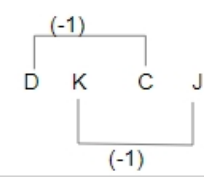
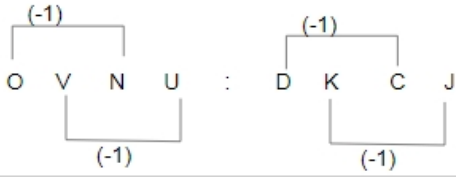
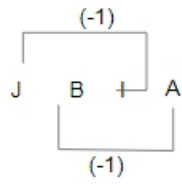
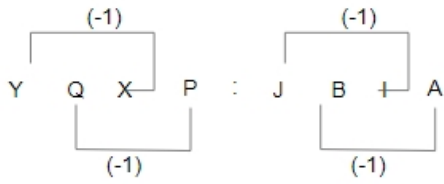
Question 3

YQXP : JBIA :: OVNU : ?

- A FAGZ
- B HRIS
- C DKCJ
- D DNEO

Answer: C

Explanation:



∴ Option C is the correct answer.

Question 4

ADGJ : BEHK :: DGJM : ?

- A KPUB
- B EHKN
- C KNQT
- D PSVY

Answer: B

Explanation:

In ADGJ : BEHK

- A (+1) → B
- D (+1) → E
- G (+1) → H
- J (+1) → K

Similarly,

In DGJM : ?

- D (+1) → E
- G (+1) → H
- J (+1) → K
- M (+1) → N

? = EHKN

∴ Option B is the correct answer.

Question 5

ACE : BDF :: GIK : ?

- A HJL
- B AXP
- C CFG
- D GFC

Answer: A

Explanation:

In ACE : BDF

A (+1) → B

C (+1) → D

E (+1) → F

Similarly,

In GIK : ?,

G (+1) → H

I (+1) → J

K (+1) → L

∴ Option A is the correct answer.

Question 6

CAT : BIG :: DDY : ?

A CLL

B CLM

C CML

D CEP

Answer: A

Explanation:

For CAT : BIG,

C (-1) → B

A (+8) → I

T (+13) → G

Similarly,

For DDY : ?,

D (-1) → C

D (+8) → L

Y (+13) → L

∴ Option CLL is the correct answer.

Question 7

1 : 1 :: 10 : ?

A 12

B 110

C 210

D 1000

Answer: D

Explanation:

1 : ($1^3 = 1$)

10 : ($10^3 = 1000$)

Question 8

7 : 56 :: 5 : ?

- A 25
- B 26
- C 30
- D 35

Answer: C

Explanation:

$$7 \times (7 + 1) = 56$$

$$5 \times (5 + 1) = 30$$

Instructions

For the following questions answer them individually

Question 9

The following numbers fall in a group. Which one does not belong to the group ?

53, 63, 83, 73

- A 53
- B 63
- C 83
- D 73

Answer: B

Explanation:

Only 63 is divisible by 3 so 63 not belong to this group.

∴ Option B is correct answer.

Question 10

Which one is the same as Mumbai, Kolkata and Cochin

- A Delhi
- B Kanpur
- C Chennai
- D Sholapur

Answer: C

Explanation:

Mumbai, Kolkata and Cochin are the capitals of states similarly Chennai is capital of Tamilnadu.

Instructions

In the following questions, find the odd word/letters/number pair from the given alternatives.

Question 11

- A Kolkata

- B Vishakhapatnam
- C Bengaluru
- D Haldia

Answer: C

Explanation:

Except Bengaluru remaining all are ports.

Question 12

- A Cabbage
- B Carrot
- C Potato
- D Beetroot

Answer: A

Explanation:

Carrot, Potato and Beetroot are the root so Cabbage is odd.

Question 13

- A HGFE
- B PONM
- C DCBA
- D MSTU

Answer: D

Explanation:

In HGFE,

$H - 1 \rightarrow G - 1 \rightarrow F - 1 \rightarrow E$

In PONM,

$P - 1 \rightarrow O - 1 \rightarrow N - 1 \rightarrow M$

In DCBA,

$D - 1 \rightarrow C - 1 \rightarrow B - 1 \rightarrow A$

In MSTU,

$M + 6 \rightarrow S + 1 \rightarrow T + 1 \rightarrow U$

\therefore Option D is different.

Question 14

- A GFI
- B VUX
- C POR
- D LKM

Answer: D

Explanation:

In GFI,

$$G - 1 \rightarrow F + 3 \rightarrow I$$

In VUX,

$$V - 1 \rightarrow U + 3 \rightarrow X$$

In POR,

$$P - 1 \rightarrow O + 3 \rightarrow R$$

In LKM,

$$L - 1 \rightarrow K + 2 \rightarrow M$$

∴ Option D is the correct answer.

Question 15

A vwqp

B yxmn

C gfkl

D cbrs

Answer: A

Explanation:

In the vwqp,

$$v + 1 = w - 6 = q + 1 = p$$

In the yxmn,

$$y - 1 = x - 11 = m + 1 = n$$

In the gfkl,

$$g - 1 = f + 5 = k + 1 = l$$

In the cbrs,

$$c - 1 = b + 16 = r + 1 = s$$

∴ vwqp is odd.

Question 16

A (324, 18)

B (441, 72)

C (117, 81)

D (186, 14)

Answer: D

Explanation:

$$(324, 18) \rightarrow 3 + 2 + 4 = 9 \text{ and } 1 + 8 = 9$$

$$(441, 72) \rightarrow 4 + 4 + 1 = 9 \text{ and } 7 + 2 = 9$$

$$(117, 81) \rightarrow 1 + 1 + 7 = 9 \text{ and } 8 + 1 = 9$$

$$(186, 14) \rightarrow 1 + 8 + 6 = 15 \text{ and } 1 + 4 = 5$$

(186, 14) is odd.

Question 17

- A (11, 121)
- B (25, 625)
- C (12, 141)
- D (15, 225)

Answer: C

Explanation:

In (11, 121),

$$(11)^2 = 121$$

In (25, 625),

$$(25)^2 = 625$$

In (12, 141),

$$(12)^2 = \mathbf{144}$$

In (15, 225),

$$(15)^2 = 225$$

therefore (12, 141) is odd.

Instructions

For the following questions answer them individually

Question 18

Find the smallest number which when divided by 25, 40, or 56 has in each case 13 as remainder.

- A 1413
- B 1400
- C 1439
- D 1426

Answer: A

Explanation:

Smallest number = (LCM of 25, 40 and 56) + remainder

$$\text{Factor of 25} = 5^2$$

$$\text{Factor of 40} = 2^3 \cdot 5$$

$$\text{Factor of 56} = 2^3 \cdot 7$$

$$\text{LCM of 25, 40 and 56} = 2^3 \cdot 5^2 \cdot 7 = 1400$$

$$\text{Smallest number} = 1400 + 13 = 1413$$

Question 19

Arrange the following words as per order in the dictionary:

1. Emplane
2. Empower
3. Embrace
4. Elocution
5. Equable

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

Answer: C

Explanation:

Order as per dictionary,

Elocution → Embrace → Emplane → Empower → Equable

Question 20

Which one of the given response would be a meaningful order of the following words ?

- 1. Sowing
- 2. Tilling
- 3. Reaping
- 4. Weeding

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

Answer: B

Explanation:

Order of meaningful word,

Tilling → Sowing → Weeding → Reaping

Question 21

Arrange the colours of the rainbow (in the reverse order)(from the top edge):

Red, Orange,

- 1. Blue
- 2. Indigo
- 3. Yellow
- 4. Green
- 5. Violet

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

Answer: A

Explanation:

Colors of the rainbow (in the reverse order) = Red, Orange, Yellow, Green, Blue, Indigo, Violet

Instructions

In the following questions, a series is given, with one term missing. Choose the correct alternative from the given ones that will complete the series.

Question 22

CEG, JLN, QSU,

- A QQS
- B TVX
- C HJL
- D UVW

Answer: C

Explanation:

In CEG,

$$C + 2 \rightarrow E + 2 \rightarrow G$$

In JLN,

$$J + 2 \rightarrow L + 2 \rightarrow N$$

In QSU,

$$Q + 2 \rightarrow S + 2 \rightarrow U$$

Similarly,

In HJL,

$$H + 2 \rightarrow J + 2 \rightarrow L$$

∴ The correct option is HJL.

Question 23

B-1, D-2, F-4, H-8, J-16,

- A K-64
- B L-32
- C M-32
- D L-64

Answer: B

Explanation:

Order of letters,

$$B + 2 = D + 2 = F + 2 = H + 2 = J + 2 = L$$

Order of numbers,

$$1 \times 2 = 2$$

$$2 \times 2 = 4$$

$$4 \times 2 = 8$$

$$8 \times 2 = 16$$

$$16 \times 2 = 32$$

So, next term = L-32

Question 24

CGJ, KOR, TXA,

- A ACE
- B JDP
- C FJM
- D UWY

Answer: C

Explanation:

For CGJ,

$$C + 4 = G$$

$$G + 3 = J$$

For KOR,

$$K + 4 = O$$

$$O + 3 = R$$

Similarly,

For FJM,

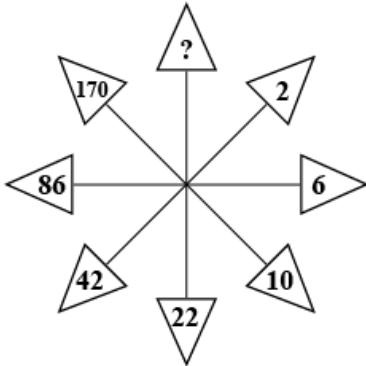
$$F + 4 = J$$

$$J + 3 = M$$

Instructions

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

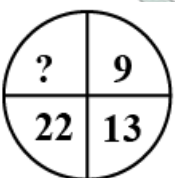
Question 25



- A 422
- B 374
- C 256
- D 342

Answer: D

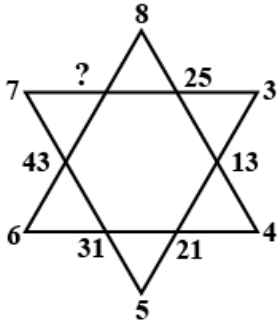
Question 26



- A 40
- B 38
- C 39
- D 44

Answer: B

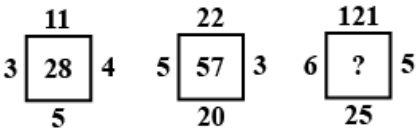
Question 27



- A 56
- B 57
- C 58
- D 59

Answer: B

Question 28



- A 176
- B 115
- C 157
- D 131

Answer: A

Explanation:

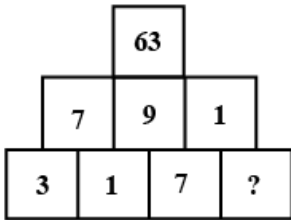
$$(11 + 5) + 3 \times 4 = 16 + 12 = 28$$

$$(22 + 20) + 5 \times 3 = 42 + 15 = 57$$

$$(121 + 25) + 6 \times 5 = 146 + 30 = 176$$

∴ The correct answer is option A.

Question 29



- A 3
- B 9
- C 5
- D 2

Answer: A

Instructions

For the following questions answer them individually

Question 30

Arrange the letters to form a word and suggest what is it.
NGDEALN

- A State
- B Country
- C River
- D Ocean

Answer: B

Explanation:

Number of the letter in NGDEALN = 7

So, possible word = Country

(∵ Number of the letter in Country = 7)

Question 31

If A = 1, B = 2 and N = 14, then BEADING = ?

- A 2154(14)97
- B 2514(14)79
- C 25149(14)7
- D 2154(14)79

Answer: C

Explanation:

A = 1,

B = 2

N = 14,

BEADING = 25149(14)7

Question 32

If $A = 1$, $AGE = 13$, then $CAR = ?$

- A 19
- B 20
- C 21
- D 22

Answer: D

Explanation:

$A = 1$,
 $AGE = 1 + 7 + 5 = 13$
 $CAR = 3 + 1 + 18 = 22$

Question 33

If an electric train runs in the direction from North to South with a speed of 150 km/hr covering 2000 km, then in which direction will the smoke of its engine go ?

- A $N \rightarrow S$
- B $S \rightarrow N$
- C $E \rightarrow W$
- D No direction

Answer: D

Explanation:

An electric train does not emit smoke. Therefore, no smoke will be going in any of the direction.

Question 34

If $1 = 1$, $2 = 3$, $3 = 5$, and $4 = 7$, then $5 = ?$

- A 9
- B 7
- C 5
- D 8

Answer: A

Explanation:

The logic is,

$$1 = 1 \times 2 - 1 = 1,$$

$$2 = 2 \times 2 - 1 = 3,$$

$$3 = 3 \times 2 - 1 = 5,$$

$$4 = 4 \times 2 - 1 = 7,$$

$$5 = 5 \times 2 - 1 = 9$$

Question 35

Find the answer of the following:

$$7 + 3 = 421$$

$$11 + 7 = 477$$

$$9 + 5 = 445$$

$$6 + 2 = ?$$

A 444

B 412

C 475

D 487

Answer: B

Explanation:

$$7 + 3 = (7 - 3)(7 \times 3) = 421$$

$$11 + 7 = (11 - 7)(11 \times 7) = 477$$

$$9 + 5 = (9 - 5)(9 \times 5) = 445$$

$$6 + 2 = (6 - 2)(6 \times 2) = 412$$

Question 36

Find the odd number out:

18, 34, 36, 54

A 34

B 54

C 18

D 36

Answer: A

Explanation:

$$18 = 1 + 8 = 9$$

$$34 = 3 + 4 = 7$$

$$36 = 3 + 6 = 9$$

$$54 = 5 + 4 = 9$$

∴ 34 is odd.

Question 37

Introducing a girl, Ram said to his son-in-law, "Her brother is the only son of my brother-in-law." Who is the girl of Ram ?

A Sister-in-law

B Niece

C Daughter

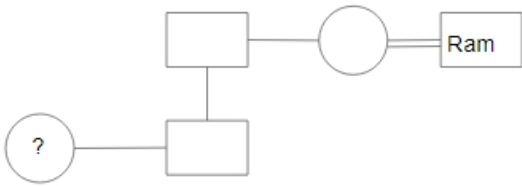
D Sister

Answer: B

Explanation:

In the following diagram,

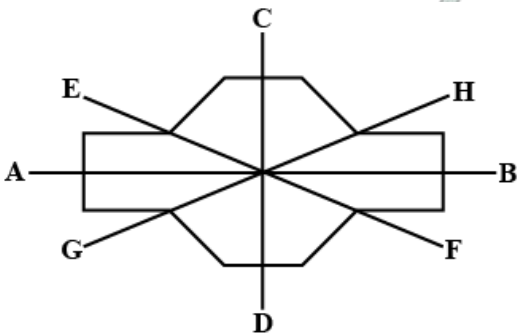
Circle represents female
 Square represents male
 Single horizontal line represents sibling
 Double horizontal line represents couple
 Single vertical line represents Mother/Father/Son/Daughter



∴ The girl is niece.

Question 38

Which of the following are the lines of symmetry ?



- A AB and CD
- B EF and GH
- C All of the above
- D None of the above

Answer: C

Question 39

Murthy drove from town A to town B. In the first hour, he travelled $\frac{1}{4}$ of the journey. In the next one hour, he travelled $\frac{1}{2}$ of the journey. In the last 30 minutes, he travelled 80 km. Find the distance of the whole journey.

- A 240 km
- B 300 km
- C 320 km
- D 360 km

Answer: C

Explanation:

Let the total journey be x km.

Remaining distance of the journey = 80 km

$$x - \frac{x}{4} - \frac{x}{2} = 80 \text{ km}$$

$$\frac{x}{4} = 80$$

$$x = 320 \text{ km}$$

∴ Total distance is 320 km of whole journey.

Question 40

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

Question figure:



A



B



C



D



Answer: C

Question 41

Which of the answer figures is not made up only by the components of the question figure?

Question figure:

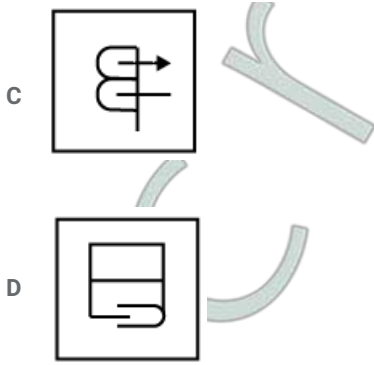


A



B

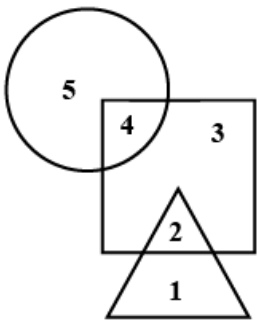




Answer: C

Question 42

Which of the following numbers is present only in the square and the circle?

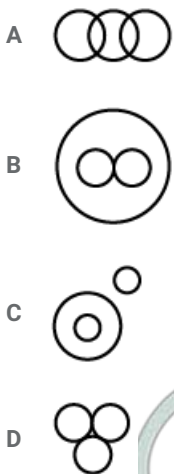


- A 5
- B 4
- C 3
- D 2

Answer: B

Question 43

Which figure represents the relation among Computer, Internet and Information-Communication Technology?



Answer: B

Instructions

In the following questions, one or two statements are given, followed by three/four Conclusions/Arguments, I, II, III and IV. You have to consider the statements to be true, even if they seem to be at variance from commonly known facts. You are to decide which of the

given Conclusions/Arguments can definitely be drawn from the given statement(s). Indicate your answer.

Question 44

Statements :

1. SAGE is a reputed publisher of both journals and books.
2. All publishing of SAGE is highly qualitative.

Conclusions :

- I. SAGE publishes qualitative articles.
- II. SAGE did not publish lowest quality articles.
- III. SAGE enriches its publications by high scrutinization.

- A Only conclusion III
B All conclusions
C Only conclusion I and II
D Only conclusion II and III

Answer: B

Explanation:

All conclusion are strong.

Question 45

Statements:

Should little children be loaded with such heavy school bags ?

Arguments :

- I. Yes, a heavy bag means more knowledge.
- II. No, heavy school bags spoil the posture of the children.
- III. Yes, children need to be adapted for earning knowledge.
- IV. No, a heavy bag never ensures knowledge gathering.

- A I and III appear to be strong arguments
B I and III are poor arguments
C II and IV are strong arguments
D I and IV are strong arguments

Answer: C

Explanation:

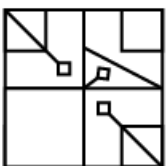
II and IV are strong arguments.

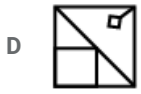
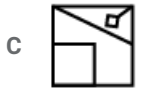
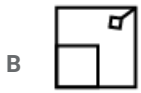
Instructions

In the following questions, which answer figure will complete the pattern in the question figure ?

Question 46

Question figure:

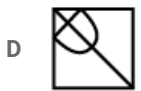
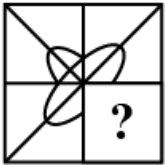




Answer: C

Question 47

Question figure:



Answer: D

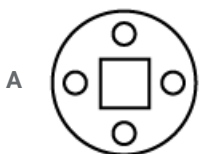
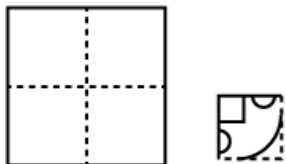
Instructions

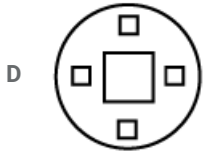
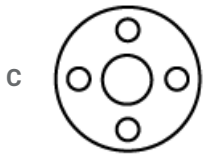
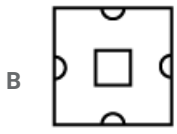
For the following questions answer them individually

Question 48

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

Question figure:



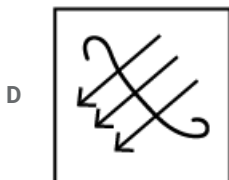
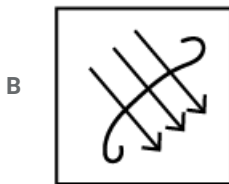
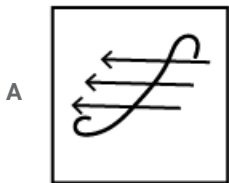


Answer: A

Question 49

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

Question figure:



Answer: D

Question 50

In the following question, a matrix of certain characters is given. These characters follow a certain trend, row-wise or column-wise. Find out this trend and choose the missing characters accordingly.

9	10	5
5	6	4
4	6	4
536	660	?

- A 450
- B 550
- C 320
- D 420

Answer: D

General Awareness

Instructions

For the following questions answer them individually

Question 51

Classification of Economics into two branches (Macro Economics and Micro Economics) was done by

- A J.M. Keynes
- B Milton Friedman
- C Ragnar Frisch
- D Adam Smith

Answer: C

Question 52

'Capital Goods' refers to goods which

- A Serve as a source of raising further capital
- B Help in the further production of goods
- C Directly go into the satisfaction of human wants
- D Find multiple uses

Answer: B

Question 53

NNP is equal to

- A GNP + Depreciation
- B GNP - Depreciation

C GNP + Exports

D GNP - Exports

Answer: B

Question 54

Rate of growth of an economy is measured in terms of

A Per capita income

B Industrial development

C Number of people who have been lifted above the poverty line.

D National income

Answer: D

Question 55

The basic characteristic of oligopoly is

A A few sellers, a few buyers

B A few sellers, many buyers

C A few sellers, one buyer

D Many sellers, a few buyers

Answer: B

Question 56

Governor will act on the advice of Council of Ministers while

A Dissolving the Legislative Assembly

B Appointing the chairman of the State Public Service Commission

C Recommending for President's Rule in the State

D Returning a bill for reconsideration

Answer: A

Question 57

The Supreme Court of India was set up by the

A Regulation Act, 1773

B Pitts India Act, 1784

C Charter Act, 1813

D Charter Act, 1833

Answer: A

Question 58

Which Constitutional Amendment provided Constitutional status to Panchayat Raj Institutions ?

- A 93rd Amendment
- B 44th Amendment
- C 42nd Amendment
- D 73rd Amendment

Answer: D

Question 59

Who has the power to pardon in case of capital punishment ?

- A Prime Minister
- B President
- C Chief Justice
- D Attorney General of India

Answer: B

Question 60

The Union Public Service Commission of India has been established under

- A Article 315
- B Article 320
- C Article 325
- D Article 335

Answer: A

Question 61

The Harappans worshipped

- A Shiva, Parvathi and Vishnu
- B Mother Goddess and Prashupathi
- C Vishnu and Mother Goddess
- D Pashupathi and Vishnu

Answer: B

Question 62

Gandhiji started the Dandi March for

- A Poorna Swaraj

- B Home-rule
- C Protest against the imposition of Salt Tax
- D Responsible Government

Answer: C

Question 63

The famous court poet of Akbar was

- A Birbal
- B Tulsidas
- C Rahim Khan
- D Bairam Khan

Answer: B

Question 64

Who established four great Mathas at the four corners of India - Sringeri, Puri, Dwaraka and Badrinath ?

- A Shankara
- B Ramanuja
- C Madhva
- D Ramananda

Answer: A

Question 65

The local name of Mohenjodaro is

- A Mound of the living
- B Mound of the great
- C Mound of the dead
- D Mound of bones

Answer: C

Question 66

Which is the longest dam in India ?

- A Bhakra-Nangal
- B Rihand
- C Hirakud
- D Nagarjuna Sagar

Answer: C

Question 67

The Thermal Power Plant in Tamil Nadu is

- A Kundah
- B Ramagundam
- C Pykara
- D Neyveli

Answer: D

Question 68

Which of the following regions does not come under the Mediterranean type of climate ?

- A Iberian Peninsula
- B California coast
- C Chilean coast
- D Eastern coast of South Africa

Answer: D

Question 69

The main cause of faulting is

- A Tension
- B Wind
- C Tidal activity
- D Gravitational force

Answer: A

Question 70

'Pan America' refers to

- A North America
- B South America
- C Central America
- D All the above

Answer: D

Question 71

Most primitive living vascular plants are

- A Brownalgae
- B Cycas

- C Fems
- D Sphabnum

Answer: C

Question 72

Temporary wilting occurs in plants due to

- A Respiration
- B Transpiration
- C Photosynthesis
- D Absorption of water

Answer: B

Question 73

Lichens are a symbiotic association of

- A Algae and Fungi
- B Bacteria and Fungi
- C Bacteria and Algae
- D Fungi and Higher plants

Answer: A

Question 74

Photophobia is caused by the deficiency of

- A Vitamin B1
- B Vitamin B2
- C Vitamin B4
- D Vitamin B6

Answer: B

Question 75

Which of the following is present only in plant cell ?

- A Cell membrane
- B Mitochondria
- C Cell wall
- D Endoplasmic reticulum

Answer: C

Question 76

The yellow colour of mangoes is due to the presence of

- A Chlorophyll
- B Anthocyanin
- C Anthoxanthin
- D Carotene

Answer: D

Question 77

Lunar eclipse is caused by shadow of the

- A Earth on the Moon
- B Moon on the Sun
- C Earth on the Sun
- D Earth and the Moon on other stars

Answer: A

Question 78

The largest planet in the solar system is

- A Venus
- B Mars
- C Jupiter
- D Earth

Answer: C

Question 79

Asteroid belt is a region in the solar system that exists between the orbits of

- A Venus and Mars
- B Mars and Jupiter
- C Mercury and Earth
- D Jupiter and Uranus

Answer: B

Question 80

Electrocardiograph (ECG) is used to measure

- A Blood Count
- B Heart Beat

C Temperature

D Electricity

Answer: B

Question 81

USB stands for

A Unique Serial Bus

B Universal Serial Bus

C Unary Serial Bus

D Universal Secondary Bus

Answer: B

Question 82

In computer network terminology, WAN stands for

A World area network

B Wide area network

C Wide array net

D Wireless area network

Answer: B

Question 83

Which element produces hydrogen on reaction with strong alkali ?

A Si

B C

C P

D S

Answer: D

Question 84

Which metal does not react with dilute H_2SO_4 ?

A Pb

B Fe

C Zn

D Mg

Answer: A

Question 85

The unit of rate of reaction is

- A Mol lit⁻¹ sec⁻¹
- B Sec mol⁻¹
- C Moles sec⁻¹
- D Joules sec⁻¹

Answer: A

Question 86

Salt that dissolves in aqueous ammonia solution is

- A $HgCl_2$
- B $PbCl_2$
- C $Cu(OH)_2$
- D $Al(OH)_3$

Answer: C

Question 87

Residence time of water molecule in the ocean is

- A 3.5 years
- B 3.5 million years
- C 35 years
- D 35000 years

Answer: C

Question 88

Biotic environment includes

- A Producers
- B Consumers
- C Decomposers
- D All the above

Answer: D

Question 89

A natural phenomenon that becomes harmful due to pollution is

- A Global warming

- B Ecological balance
- C Greenhouse effect
- D Desertification

Answer: C

Question 90

Decomposers include

- A Bacteria
- B Fungi
- C Both Bacteria and Fungi
- D Animals

Answer: C

Question 91

Who said about religion that "it is the opium of the masses"?

- A Hitler
- B Stalin
- C Lenin
- D Marx

Answer: D

Question 92

The first woman in the world to have climbed Mt. Everest twice is

- A Bachendri Pal
- B Molly Chacko
- C Santosh Yadav
- D Theresia Kiesel

Answer: C

Question 93

What is the basic foundation of

- A Political campaigns
- B Social movements
- C Religion and morality
- D Freedom of the individual

Answer: D

Question 94

Amir Khusran was a famous poet in the court of

- A Akbar
- B Shahjahan
- C Ibrahim Lodhi
- D Alauddin Khilji

Answer: D

Question 95

In the year 1905, Gopal Krishna Gokhale founded the

- A Servants of India Society
- B Asiatic Society
- C Brahmo Samaj
- D Bharat Sewak Samaj

Answer: A

Question 96

Gandhiji believed that Satyagraha is a weapon of

- A the poor
- B the weak
- C the untouchables
- D the brave

Answer: D

Question 97

Pt. Shiv Kumar Sharma is an exponent of

- A Mandolin
- B Santoor
- C Sitar
- D Veena

Answer: B

Question 98

Patanjali is well-known for the compilation of

- A Yogasutra
- B Panchatantra

C Brahmasutra

D Ayurveda

Answer: A

Question 99

Which of the following Presidents of America abolished Slavery ?

A Abraham Lincoln

B Thomas Jefferson

C George Washington

D Stanley Jackson

Answer: A

Question 100

Who is the first woman cosmonaut of the world

A Valentina Tereshkova

B Maria Estela Peron

C Svetlana Savitskaya

D Kay Cotte

Answer: A

General Engineering (Mechanical)

Instructions

For the following questions answer them individually

Question 101

Which law of motion (of Newton) gives the measure of force ?

A Newton's first law

B Newton's second law

C Newton's third law

D None of these

Answer: B

Question 102

The shear stress at the centre of a circular shaft undertorsion is

A maximum

B minimum

C zero

D unpredictable

Answer: C

Question 103

The direction of frictional force acting on a body which can slide on a fixed surface is

A in the direction of motion

B normal to the direction of motion

C unpredictable

D opposite to the direction of motion

Answer: D

Question 104

What strength of the material is to be considered for design of a ductile component under cyclic load ?

A Ultimate strength

B Yield strength

C Endurance strength

D Fracture strength

Answer: C

Question 105

For any given power and permissible shear stress, the rotational speed of shaft and its diameter are correlated by the expression

A $ND^3 = \text{constant}$

B $ND^2 = \text{constant}$

C $ND = \text{constant}$

D $\sqrt{ND} = \text{constant}$

Answer: A

Question 106

The angle turned by a wheel while it starts from rest and accelerates at constant rate of 3 rad/s^2 for an interval of 20 sec is

A 900 rad

B 600 rad

C 1200 rad

D 300 rad

Answer: B

Question 107

Stress due to change in temperature developed in a bar depends upon

- A coefficient of thermal expansion
- B thermal conductivity
- C density
- D Poisson's ratio

Answer: A

Question 108

Strength of the beam depends on

- A Bending moment
- B Density
- C Section modulus
- D c.g. of the section

Answer: C

Question 109

A reversible heat engine working at the rate of 100kW has an efficiency of 20%. The magnitudes of heat transfer rate from the source and to the sink in kW would be, respectively,

- A 200, 100
- B 300, 200
- C 500, 400
- D 1000, 900

Answer: C

Question 110

The friction between objects that are stationary is called

- A static friction
- B rolling friction
- C kinetic friction
- D dynamic friction

Answer: A

Question 111

Fatigue of a component is due to

- A cyclic load
- B static load
- C constant heating

D collision

Answer: A

Question 112

If V_i be the inlet absolute velocity to blades, V_b be the tangential blade velocity and α be the nozzle angle, then for maximum blade efficiency for single-stage impulse turbine

A $\frac{V_b}{V_i} = \cos \alpha$

B $\frac{V_b}{V_i} = \frac{\cos \alpha}{2}$

C $\frac{V_b}{V_i} = \cos^2 \alpha$

D $\frac{V_b}{V_i} = \frac{\cos^2 \alpha}{2}$

Answer: B

Question 113

In diesel engines, the duration between the time of injection and ignition, is known as

A pre-ignition period

B delay period

C ignition period

D burning period

Answer: B

Question 114

The process of supplying the in take air to the engine cylinder at a density more than the density of the surrounding atmosphere is known as

A scavenging

B detonation

C supercharging

D polymerisation

Answer: C

Question 115

Which of the following expressions gives the entropy change in an isobaric heating process from T_1 to T_2 ?

A $mC_p \ln \frac{T_2}{T_1}$

B $mC_p(T_2 - T_1)$

C $mC_p \frac{(T_2 - T_1)}{T_0}$

D $mC_p(T_1 + T_2)$

Answer: A

Question 116

Morsetest is conducted on

- A vertical engines
- B horizontal engines
- C single cylinder engines
- D multi cylinder engines

Answer: D

Question 117

In spark ignition (SI) engines, the possibility of knocking can be reduced by

- A increasing compression ratio
- B decreasing compression ratio
- C increasing the coolant temperature
- D advancing the spark timing

Answer: B

Question 118

Higher compression ratio in diesel engine results in

- A lower temperature
- B lower pressure
- C same pressure
- D higher pressure

Answer: D

Question 119

What salts of calcium and magnesium cause temporary hardness of boiler feed water?

- A Chlorides
- B Bicarbonates
- C Nitrates
- D Sulphites

Answer: B

Question 120

Which of the following does not relate to steam engine ?

- A Crank shaft

- B Cross head
- C Steam chest
- D Steam separator

Answer: D

Question 121

Self-ignition temperature of diesel a compared to petrol

- A is higher
- B is lower
- C is same
- D varies considerably

Answer: A

Question 122

The binding material used in cemented carbide tools is

- A Nickel
- B Cobalt
- C Chromium
- D Carbon

Answer: C

Question 123

The water hammer pressure in a pipe can be reduced by

- A using pipe of greater diameter
- B using a more elastic pipe
- C using pipe of greater wall thickness
- D increasing the velocity of pressure wave

Answer: B

Question 124

When a fluid is in motion, the pressure at a point is same in all directions. Then the fluid is

- A Real fluid
- B Newtonian fluid
- C Ideal fluid
- D Non-Newtonian fluid

Answer: C

Question 125

Density of water is maximum at

- A 0°C
- B 4K
- C 4°C
- D 100°C

Answer: C

Question 126

The ability of a tool material to resist shock or impact forces is known as

- A wear resistance
- B toughness
- C red hardness
- D machinability

Answer: B

Question 127

The tool material which has high heat and wear resistance is

- A Ceramics
- B Cemented carbide
- C Carbon steels
- D Medium alloy steel

Answer: B

Question 128

To improve the surface finish of castings, the following additive is used in the moulding sand :

- A Resins
- B Oils
- C Wood flour
- D Sea coal

Answer: D

Question 129

Cereals are added to the moulding sand to improve the following:

- A Porosity

- B Green strength
- C Hot strength
- D Edge hardness

Answer: B

Question 130

Plastic toys are usually produced by using

- A shell moulding
- B green sand moulding
- C plaster moulding
- D injection moulding

Answer: D

Question 131

Generally used fuel gas in gas welding is

- A N_2
- B CO_2
- C C_2H_2
- D He

Answer: C

Question 132

Spot welding, projection welding and seam welding belong to the category of

- A electric resistance welding
- B forge welding
- C thermit welding
- D arc welding

Answer: A

Question 133

Which one of the following is an example of solid state welding ?

- A Gas welding
- B Arc welding
- C Thermit welding
- D Forge welding

Answer: D

Question 134

The shape and size of sand grains affects the following property :

- A Adhesiveness
- B Porosity
- C Refractoriness
- D Strength

Answer: B

Question 135

The velocity distribution for flow over a flat plate is given by $u = (y - y^2)$ in which u is velocity in metres per second at a distance y metres above the plate. What is the shear stress value at $y = 0.15$ m ? The dynamic viscosity of fluid is 8.0 poise.

- A 12.4 N/m²
- B 1.24 N/m²
- C 0.56 N/m²
- D 5.6 N/m²

Answer: C

Question 136

Froude's Number relates to

- A inertia force and gravity force
- B inertia force and pressure force
- C inertia force and surface tension force
- D inertia force and elastic force

Answer: A

Question 137

In pitot-tube the velocity of flow at a point is reduced to zero. That point is called as

- A stagnation point
- B critical point
- C metacentre
- D equilibrium point

Answer: A

Question 138

The velocity distribution in a pipe flow is parabolic if the flow is

- A uniform, turbulent

- B uniform, laminar
- C non-uniform, steady
- D rotational, compressible

Answer: B

Question 139

Mercury does not wet the glass surface. This property of mercury is due to

- A adhesion
- B cohesion
- C surface tension
- D viscosity

Answer: C

Question 140

Loss of head due to friction in a uniform diameter pipe with viscous flow is

- A Re
- B $\frac{1}{Re}$
- C $\frac{4}{Re}$
- D $\frac{16}{Re}$

Answer: D

Question 141

Maximum theoretical efficiency of Pelton wheel is obtained when the ratio of bucket speed to jet speed is

- A 0.26
- B 0.98
- C 0.46
- D 0.58

Answer: C

Question 142

The velocity at a point on the crest of a model dam was measured to be 1m/s. The corresponding prototype velocity for a linear scale ratio of 25, in m/s, is

- A 25
- B 2.5
- C 5
- D 0.04

Answer: C

Question 143

Pressure force on the 15 cm diameter headlight of an automobile travelling at 0.25 m/s is

- A 10.4 N
- B 6.8 N
- C 4.8 N
- D 3.2 N

Answer: B

Question 144

A piece of metal of specific gravity 7 floats in mercury of specific gravity 13.6. What fraction of its volume is under mercury ?

- A 0.5
- B 0.4
- C 0.515
- D 0.415

Answer: C

Question 145

The friction head lost due to flow of a viscous fluid through a circular pipe of length L and diameter d with a velocity v and pipe Fanning friction factor f is

- A $\frac{4fL}{d} \cdot 2g v^2$
- B $\frac{4fL}{\pi d^2} \cdot 2g v^2$
- C $\frac{v^2}{2g}$
- D $\frac{4fL}{\pi d} \cdot 2g v^2$

Answer: A

Question 146

The ratio of pressures between two points A and B located respectively at depths 0.5 m and 2 m below a constant level of water in a tank is

- A 1 : 1
- B 1 : 2
- C 1 : 4
- D 1 : 16

Answer: C

Question 147

A hydraulic turbine runs at 240 rpm under a head of 9 m. What will be the speed (in rpm) of the turbine if operating head is 16 m?

- A 320
- B 426
- C 264
- D 230

Answer: A

Question 148

The discharge of a liquid of kinematic viscosity $4 \times 10^{-2} \text{ m}^2/\text{s}$ through a 80 mm diameter pipe is $3200\pi \times 10^{-4} \text{ m}^3/\text{s}$. The flow is

- A laminar
- B turbulent
- C transition
- D critical

Answer: A

Question 149

Assertion (A) :

If a hot metal ball is quenched in a liquid of low temperature, heat transfer will take place from metal ball to liquid and not in the reverse direction.

Reason(R) :

Heat transfer process from hot metal ball to liquid at lower temperature complies with the increase of entropy principle i.e. $S_{gen} \geq 0$ and the reverse process does not.

- A Both A and R are true and R is the correct explanation of A
- B Both A and R are true, but R is not the correct explanation of A
- C A is true, but R is false
- D R is true, but A is false

Answer: A

Question 150

The boiling and freezing points for water are marked on a temperature scale P as $130^\circ P$ and $-20^\circ P$ respectively. What will be the reading on this scale corresponding to $60^\circ C$ on Celsius scale ?

- A $60^\circ P$
- B $70^\circ P$
- C $90^\circ P$
- D $110^\circ P$

Answer: B

Question 151

In a reaction turbine, the heat drop in fixed blades is 8 kJ/kg and total heat drop per stage is 20 kJ/kg. The degree of reaction is

- A 40%
- B 60%
- C 66.7%
- D 80%

Answer: B

Question 152

A closed balloon containing 10 kg of helium receives 5 kJ/kg of heat. During this process, the volume of the balloon slowly increases by 0.2 m^3 at constant pressure of 100 kPa. The change in internal energy, in kJ, is

- A 10
- B 20
- C 30
- D 70

Answer: C

Question 153

A gas in a container A is in thermal equilibrium with another gas of the same mass in container B. If the corresponding pressures and volumes are denoted by suffixes A and B, then which of the following statements is true?

- A $P_A \neq P_B; V_A = V_B$
- B $P_A = P_B; V_A \neq V_B$
- C $\frac{P_A}{V_A} = \frac{P_B}{V_B}$
- D $P_A V_A = P_B V_B$

Answer: D

Question 154

A liquid flows from low level Z_1 , pressure P_1 , to a higher level Z_2 , pressure P_2 . It can be concluded

- A first law of thermodynamics has been violated
- B second law of thermodynamics has been violated
- C $Z_2 < Z_1$
- D $P_2 < P_1$

Answer: D

Question 155

The food compartment of a refrigerator is maintained at 4°C by removing heat from it at a rate of 360 kJ/min. If the required power input to the refrigerator is 2 kW, the COP of the refrigerator is

- A 2.0
- B $\frac{1}{3}$
- C 0.5
- D 3.0

Answer: D

Question 156

For a 4-stroke diesel engine, the compression ratio is 21 : 1 and the cut-off ratio is 2: 1. What is its expansion ratio ?

- A 7 : 1
- B 10.5 : 1
- C 12 : 1
- D 19 : 1

Answer: B

Question 157

A ball is dropped vertically downwards, it hits the floor with a velocity of 9 m/s and bounces to a distance of 1.2 m. Coefficient of restitution between the floor and the ball is

- A 0.54
- B zero
- C 1
- D 0.27

Answer: A

Question 158

For a material with Poisson's ratio 0.25, the ratio of modulus of rigidity to modulus of elasticity will be

- A 0.4
- B 1.2
- C 2.0
- D 3.6

Answer: A

Question 159

If equal and opposite forces applied to a body tend to elongate it, then the stress produced is

- A tensile stress
- B bending stress
- C compressive stress

D shear stress

Answer: A

Question 160

What type of contact occurs during meshing of helical gears ?

A Point

B Line

C Area

D Volume

Answer: A

Question 161

Which one of the following drives is used for transmitting power without slip ?

A Belt drives

B Rope drives

C Cone pulleys

D Chain drives

Answer: D

Question 162

The contact between cam and follower is to form a

A lower pair

B higher pair

C sliding pair

D rolling pair

Answer: B

Question 163

Which of the following is antifriction bearing ?

A Needle bearing

B Pedestal bearing

C Collar bearing

D Hydrostatic bearing

Answer: A

Question 164

Helical gears have their teeth

- A inclined to wheel rim
- B straight over the wheel rim
- C curved over the wheel rim
- D cut on the surfaces of the frusta of cones

Answer: A

Question 165

When the speed of governor increases, then

- A height of governor and radius of rotation increase
- B height of governor and radius of rotation decrease
- C height of governor decreases but radius of rotation increases
- D height of governor increases but radius of rotation decreases

Answer: C

Question 166

A body of weight 30 N rests on a horizontal floor. A gradually increasing horizontal force is applied to the body which just starts moving when the force is 9 N. The coefficient of friction between the body and the floor will be

- A $\frac{10}{3}$
- B $\frac{3}{10}$
- C $\frac{1}{3}$
- D $\frac{1}{9}$

Answer: B

Question 167

A body of weight W is placed on a rough inclined plane. The inclination of the plane with the horizontal is less than the angle of friction. The body will

- A be in equilibrium
- B move downwards
- C move upwards
- D None of the above

Answer: A

Question 168

An adiabatic process in a thermodynamic system is one in which there is

- A a limited heat transfer to or from the system through the boundary

- B no heat transfer to or from the system through the boundary
- C no energy transfer to or from the system through the boundary
- D no internal energy change in the system

Answer: B

Question 169

A device used to increase the temperature of saturated steam without raising its pressure is called

- A fusible plug
- B economiser
- C blowoff cock
- D superheater

Answer: D

Question 170

Maximum diagram efficiency for Parson's reaction turbine is given by

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

Answer: D

Question 171

In an isothermal process, the internal energy

- A always increases
- B always decreases
- C increases or decreases
- D remains constant

Answer: D

Question 172

Which of the following is a boiler mounting ?

- A Safety valve
- B Economizer
- C Superheater

D Feed pump

Answer: A

Question 173

Which part of a petrol engine would need modifications if the engine is to be made to run on LPG?

- A Piston
- B Crank shaft
- C Valves
- D Carburettor

Answer: D

Question 174

The compression ratio for a practical diesel engine usually lies in the range

- A 5-7
- B 7-9
- C 10-15
- D 16-22

Answer: D

Question 175

For a four-cylinder engine, the firing order for evenness of torque is

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

Answer: D

Question 176

The drag coefficient is defined as

- A $\left(\frac{F_D}{A}\right) \rho v_0^2$
- B $\left(\frac{F_D}{A}\right) \frac{1}{2\rho v_0^2}$
- C $\frac{F_D}{(0.5\rho v_0^2)}$
- D $\frac{F_{D2}}{(0.5\rho v_0 A)}$

Answer: D

Question 177

The length of the divergent portion of venturimeter in comparison to convergent portion is

- A same
- B more
- C less
- D depending upon the type of flow

Answer: B

Question 178

The delay period in a petrol engine is of the order of

- A 0.001 sec
- B 0.002 sec
- C 0.01 sec
- D 0.05 sec

Answer: B

Question 179

Octane number of iso-octane is

- A 50
- B 70
- C 0
- D 100

Answer: D

Question 180

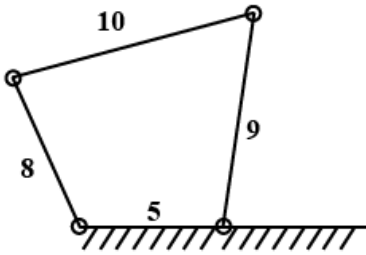
The silencer of an IC engine

- A reduces noise
- B decreases brake specific fuel consumption
- C increases brake specific fuel consumption
- D has no effect on efficiency

Answer: A

Question 181

Figure shows a four bar chain and the number indicates the respective link lengths in cm. The type of the mechanism is known as



- A slider crank
- B double crank
- C crank rocker
- D double rocker

Answer: B

Question 182

A slider sliding at 10 cm/s on a link which is rotating at 60 rpm, is subjected to Coriolis acceleration of magnitude, in cm^2/s ,

- A 20π
- B 10π
- C 40π
- D 80π

Answer: C

Question 183

The twining moment (T) delivered by a flywheel with respect to its angular displacement is given by the following expression:

$$T = 14000 + 7000 \sin \theta$$

The values of θ for which delivered torque is equal to mean torque for a single cycle are

- A $0^\circ, 180^\circ, 360^\circ$
- B $90^\circ, 270^\circ, 360^\circ$
- C $90^\circ, 270^\circ, 180^\circ$
- D $0^\circ, 270^\circ, 360^\circ$

Answer: A

Question 184

The shearing strength of a rivet is 50 N/mm^2 . If the diameter of the rivet is doubled, then its shearing strength will be

- A 100 N/mm^2
- B 200 N/mm^2
- C 50 N/mm^2

D 300 N/mm²

Answer: B

Question 185

A differential gear in an automobile is a

- A simple gear train
- B epicyclic gear train
- C compound gear train
- D speed reducer

Answer: B

Question 186

Creep in belt drive is due to

- A weak material of the belt
- B weak material of the pulley
- C uneven extensions and contractions of the belt when it passes from tight to slack side
- D expansion of the belt

Answer: C

Question 187

The crank shaft turning in a journal bearing forms a

- A turning pair
- B sliding pair
- C rolling pair
- D helical pair

Answer: A

Question 188

Name the mechanism in which the Coriolis component of acceleration is to be considered.

- A Quick return motion mechanism
- B Four-bar mechanism
- C Slider crank mechanism
- D Beam engine

Answer: A

Question 189

Bevel gears are used to transmit rotary motion between two shafts whose axes are

- A Perpendicular
- B Parallel
- C Non-intersecting
- D Non-coplanar

Answer: A

Question 190

The coefficient of discharge (c_d) of an orifice varies with

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

Answer: C

Question 191

Using Blasius equation, the friction factor for turbulent flow through pipes varies as

- A Re^{-1}
- B $Re^{-0.5}$
- C $Re^{-0.33}$
- D $Re^{-0.25}$

Answer: D

Question 192

The specific speed (N_s) of a centrifugal pump is given by

- A $\frac{N\sqrt{Q}}{H^3}$
- B $\frac{N\sqrt{Q}}{H^4}$
- C $\frac{N\sqrt{Q}}{H}$
- D $\frac{N\sqrt{Q}}{H^5}$

Answer: B

Question 193

Pressure intensity inside the water droplets is (where σ - surface tension, d - diameter of bubble)

- A $p = \frac{8\sigma}{d}$

B $p = \frac{2\sigma}{d}$

C $p = \frac{4\sigma}{d}$

D $p = \frac{\sigma}{d}$

Answer: C

Question 194

The length of a rectangular weir is L and height H_1 . The maximum depth of water on the upstream side of the weir is H . Flow rate over the notch (Q) is

A $Q = \frac{2}{3}c_dL\sqrt{2g}H^5$

B $Q = \frac{2}{3}c_dL\sqrt{2g}(H - H_1)^5$

C $Q = \frac{2}{3}c_dL\sqrt{2g}H^3$

D $Q = \frac{2}{3}c_dL\sqrt{2g}(H - H_1)^3$

Answer: D

Question 195

Low specific speed of a turbine implies that it is

A Propeller turbine

B Francis turbine

C Impulse turbine

D Kaplan turbine

Answer: C

Question 196

Flow of water in a pipe about 3 metres in diameter can be measured by

A Orifice plate

B Venturi

C Pitot tube

D Nozzle

Answer: C

Question 197

In a pitot tube, at the stagnation point

A pressure is zero

B total energy is zero

C pressure head is equal to velocity

D all the velocity head is converted into pressure head

Answer: D

Question 198

Navier – Stokes equations are associated with

- A Buoyancy
- B Supersonic flow
- C Vortex flow
- D Viscous flow

Answer: D

Question 199

A hydrometer is used to determine

- A relative humidity
- B surface tension of liquids
- C specific gravity of liquids
- D viscosity of liquids

Answer: C

Question 200

In flow through a pipe, the transition from laminar to turbulent flow does not depend on

- A velocity of the fluid
- B density of the fluid
- C length of the pipe
- D diameter of the pipe

Answer: C