



## SSC JE Mechanical Engineering 2012

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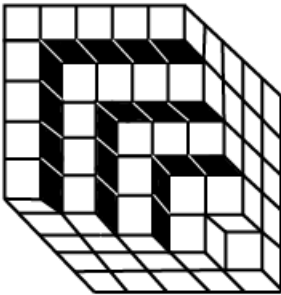
# General Intelligence and Reasoning

## Instructions

For the following questions answer them individually

### Question 1

How many white cubes are there in the given structure?



A 40

B 65

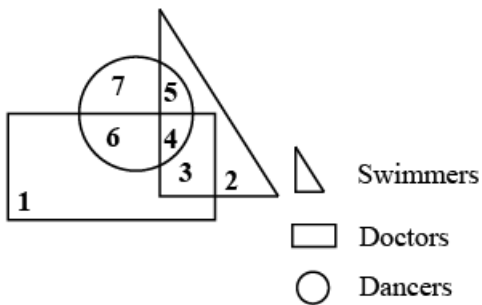
C 16

D 24

Answer: A

### Question 2

In the following Venn diagram, identify the number which denotes Doctors who know both Swimming and Dancing.



A 6

B 5

C 3

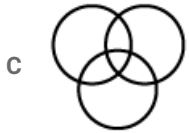
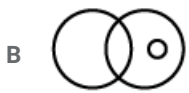
D 4

Answer: D

### Question 3

Which one of the following diagrams best depicts the relationship among College Graduates, Professional Athletes and Great Scientists?





Answer: C

#### Instructions

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

#### Question 4

##### Statements:

**Mind is a stream of thoughts.**

**Mind is working all the time.**

##### Conclusions:

**I: If there is no thought, there is no mind.**

**II: Thoughtless people will not succeed.**

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

Answer: A

#### Question 5

##### Statements:

**Teachers should have empathy.**

**Students need empathetic approach from their teachers.**

##### Conclusions:

**I: Persons without empathy cannot become good teachers.**

**II: Good teachers understand the problems of their students.**

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

Answer: C

#### Instructions

For the following questions answer them individually

Question 6

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

**Question Figure:**

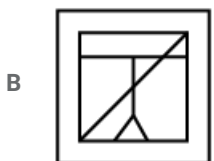
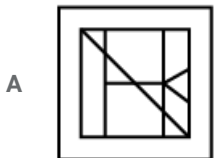
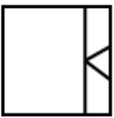


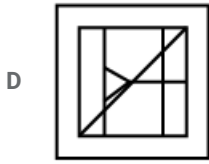
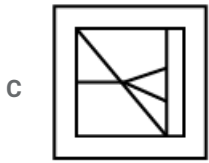
Answer: B

Question 7

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

**Question Figure:**



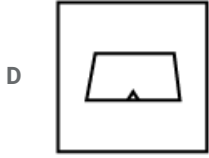
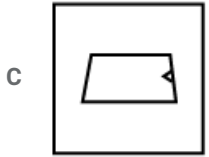
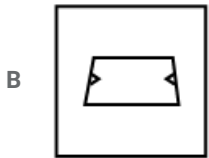


Answer: A

Question 8

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?

Question Figure:

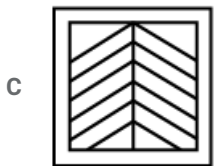
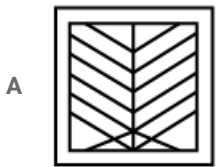
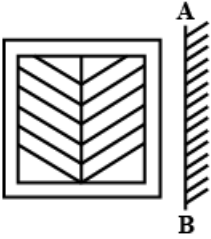


Answer: A

Question 9

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

Question Figure:



Answer: D

Question 10

A word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as in two matrices given below. The columns and rows of matrix I and II are numbered from 0 to 4. A letter from these matrices can be represented first by its row and next by its column, e.g., 'A' can be represented by 24, 31 etc. and 'P' can be represented by 11, 32, etc. Identify the set for the letters AELO.

Matrix I

	0	1	2	3	4
0	A	E	C	B	D
1	C	D	A	E	B
2	B	E	D	C	A
3	D	A	C	B	E
4	B	E	D	A	C

Matrix II

	5	6	7	8	9
5	L	M	O	N	P
6	N	P	L	M	O
7	P	M	O	L	N
8	L	N	P	M	O
9	O	N	L	P	M

A 31, 00, 23, 22

B 43, 01, 12, 42

C 12, 34, 30, 02

D 12, 30, 42, 14

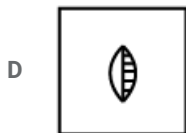
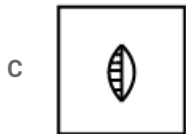
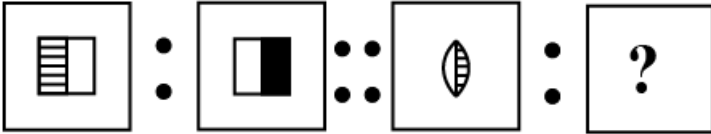
Answer: C

**Instructions**

Select the related word/letter /number/figure from the given alternatives.

**Question 11**

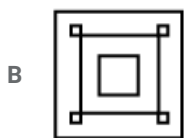
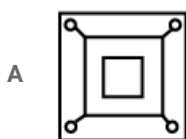
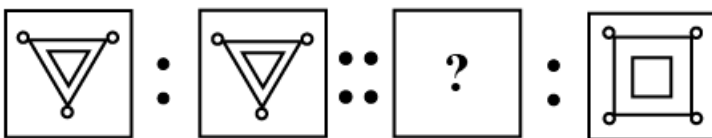
**Question Figures:**

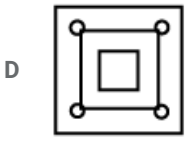
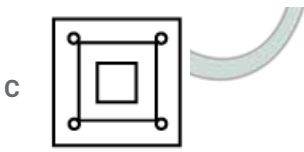


Answer: B

**Question 12**

**Question Figure:**

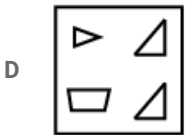
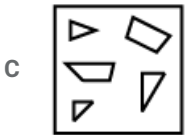
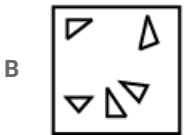
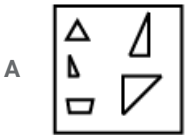
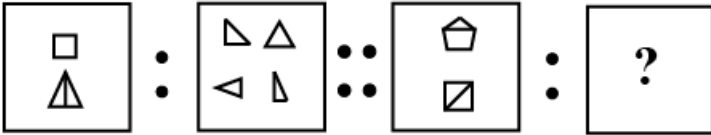




Answer: C

Question 13

Question Figures:



Answer: D

Question 14

? : JHKI :: TRUS : OMPN

A GEHF

B GEFH

C LOMP

D QMPN

Answer: A

Question 15

AEJO : ZVQL :: DINS : ?



- A WRMH
- B WSOJ
- C WRNJ
- D WSNI

Answer: A

Question 16

IRTH : HQSG :: ? : RQPO

- A QPON
- B PQRO
- C OPQR
- D SRQP

Answer: D

Question 17

16 : 64 :: 25 : ?

- A 83
- B 125
- C 55
- D 110

Answer: B

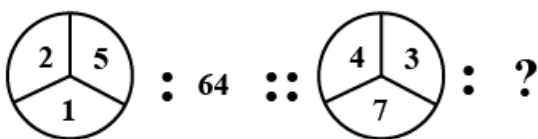
Question 18

5 : 15 :: 40 : ?

- A 60
- B 45
- C 120
- D 55

Answer: C

Question 19



- A 81
- B 196

C 169

D 324

**Answer: B**

**Instructions**

Select the one which is different from the other three responses.

**Question 20**

A Aluminium

B Tungsten

C Copper

D Diamond

**Answer: D**

**Question 21**

A Customer

B Hawker

C Broker

D Salesman

**Answer: A**

**Question 22**

A Weaver

B Spinner

C Engineer

D Potter

**Answer: C**

**Question 23**

A Champaka

B Hibiscus

C Rose

D Jasmine

**Answer: B**

**Question 24**

A Cholera

B Jaundice

- C AIDS
- D Typhoid

Answer: C

**Question 25**

- A RQFJ
- B ODHR
- C SRBH
- D RHSN

Answer: A

**Question 26**

- A 114 57 28
- B 120 60 30
- C 144 72 36
- D 124 62 31

Answer: A

**Question 27**

- A 8987
- B 6354
- C 7832
- D 2398

Answer: B

**Question 28**

- A 49 - 7
- B 36 - 6
- C 64 - 8
- D 80 - 9

Answer: D

**Instructions**

For the following questions answer them individually

**Question 29**

Arrange the given words in the order in which they occur in the dictionary and find the last but one word:

- A Faubourg

- B Fatiscent
- C Fauxbourdon
- D Favonian

Answer: C

**Question 30**

Arrange the following words in the order in which they occur in the dictionary. Which will appear fourth in the dictionary ?

- A Nucleosynthesis
- B Nucleoprotein
- C Nucleonic
- D Nuclearize

Answer: A

**Question 31**

Arrange the following words in the order in which they occur in the Dictionary :

1. Interview
2. Inventory
3. Invention
4. Interval
5. Investment

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

Answer: D

**Instructions**

Choose the correct alternative from the given responses that will complete the series:

**Question 32**

xy, wy, xy, ut, xy, ?

- A xy
- B rs
- C yx
- D sr

Answer: D

**Question 33**

PQR, HIJ, DEF, ?

- A ABC

B BCD

C DEF

D CDE

Answer: B

Question 34

NDB, LED, JGG, ?

A LNP

B HED

C HJJ

D HJI

Answer: C

Question 35

18, 54, 162, 486, 1458, ?

A 39366

B 4374

C 2187

D 13122

Answer: B

Question 36

20, 30, 42, 56, 72, ?

A 87

B 95

C 85

D 90

Answer: D

Instructions

For the following questions answer them individually

Question 37

Find the wrong number in the given series:

7, 15, 32, 65, 138

A 65

B 138

C 7

D 15

Answer: A

**Question 38**

A party consisted of a man, his wife, his three sons and their wives and three children in each son's family. How many were there in the party ?

A 17

B 24

C 22

D 13

Answer: A

**Question 39**

₹ 6,500 were divided equally among a certain number of persons. Had there been 15 more persons, each would have got ₹ 30 less. Find the original number of persons.

A 50

B 55

C 40

D 45

Answer: A

**Question 40**

From the following alternatives, select the word which cannot be formed using the letters of the given word :  
**UNIVERSITY**

A NEVER

B REST

C INVERT

D UNITE

Answer: A

**Question 41**

In a certain code MEN is written as MIN and WOMEN is written as WUMIN, then how will CHILD be written in the same code?

A CHOLD

B CHULD

C CHELD

D CHALD

Answer: A

**Question 42**

If  $Y = 2$ ,  $PEN = 11 - 22 - 13$ , then  $10 - 6 - 18 - 24 - 16 = ?$

- A QUICK
- B QUITE
- C JFRXP
- D QUACK

Answer: A

**Question 43**

Find out the number which belongs to the given group of number from the four alternatives.  
5, 25, 90, 35, 60

- A 21
- B 83
- C 15
- D 24

Answer: C

**Question 44**

If  $\div$  stands for division

$-$  stands for equal to

$\times$  stands for addition

$\div$  stands for greater than

$=$  stands for less than

$>$  stands for multiplication

$<$  stands for subtraction

then of the given alternatives which one is correct?

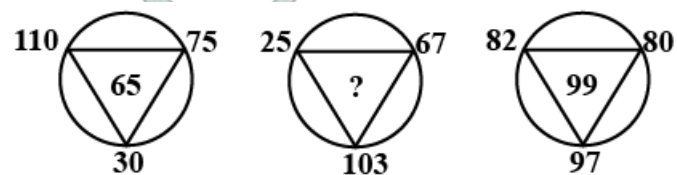
- A  $5 \times 3 < 7 \div 8 + 4 < 2$
- B  $5 + 3 > 7 - 8 \times 4 + 2$
- C  $5 > 3 \times 7 = 8 > 4 + 2$
- D  $5 < 8 > 7 - 8 > 4 + 2$

Answer: A

**Instructions**

Select the missing number from the given responses.

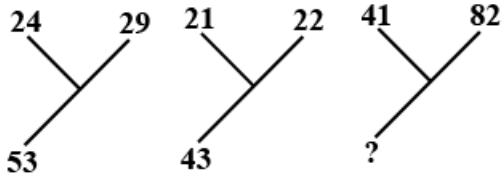
**Question 45**



- A 120
- B 195
- C 61
- D 89

Answer: C

Question 46



- A 33
- B 123
- C 121
- D 63

Answer: B

Question 47

2	5	7
6	15	21
10	19	?

- A 28
- B 52
- C 29
- D 25

Answer: B

Instructions

For the following questions answer them individually

Question 48

Going 60 metres to the South of his house, Kiran turns left and goes another 20 metres then turning to the North, he goes 40 metres and then starts walking to his house. In which direction is his house. In which direction is his house from there ?

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

Answer: B



**Question 49**

Ram started walking towards East. After 1 km, he turned South and walked 5 km. Again he turned East and walked 2 km. Finally, he turns to the North and walked 9 km. How far is he from the starting point ?

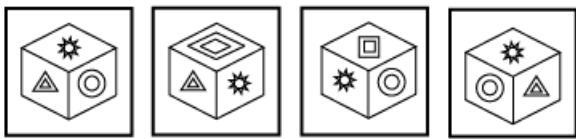
- A 5 km
- B 7 km
- C 3 km
- D 4 km

Answer: A

**Question 50**

Four positions of a cube are shown below. If symbol Sun is at the top, what symbol will be at the bottom ?

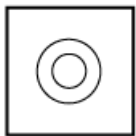
**Question Figures:**



A



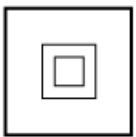
B



C



D



Answer: C

**General Awareness**

**Instructions**

For the following questions answer them individually

**Question 51**

'Liver rot' is caused by

- A Typhlops
- B Trypanosoma

C Fasciola

D Taenia

Answer: C

Question 52

"Proconveritin" is an example of

A Plasma protein

B Proteolipid

C Lipoprotein

D Glycoprotein

Answer: A

Question 53

If the filament current of a coolidge tube is increased, X-rays emitted from it will be of greater

A Velocity

B Penetration power

C Energy

D intensity

Answer: D

Question 54

The idea of stationary orbit of electrons in an atom was first introduced by

A Bohr

B Thomson

C Sommerfield

D Rutherford

Answer: A

Question 55

Which of the following pairs of particles have equal and opposite charge ?

A Proton-neutron

B None of these

C Electron-proton

D Electron-neutron

Answer: D

Question 56

In 'Isobaric process', which parameter remains constant ?

- A Temperature
- B Mass
- C Pressure
- D Volume

Answer: C

Question 57

A prototype of a system is

- A The object code of a fully developed system
- B A complete system
- C A trial version of a system under development;
- D The source code of a fully developed system

Answer: C

Question 58

An example of a mathematical function in Structured Query Language (SQL) is

- A MIN
- B COS
- C AVG
- D MAX

Answer: B

Question 59

The intensity of sound is measured in dB-scale and the threshold of hearing is

- A 10 dB
- B 20 dB
- C 0 dB
- D 5 dB

Answer: C

Question 60

PAN is pollutant of air. The full name of PAN is

- A Peroxy Acetyl Nitrate
- B Peroxy Acidal Nitrate

- C Peroxy Alkyl Nitrate
- D Peroxy Aldehyd Nitrate

Answer: A

**Question 61**

Repeated exposure to small concentrations of a toxic agent results in accumulation of toxic substance over a period of time. This is known as

- A Bio accumulation
- B Chronic accumulation
- C Biomagnification
- D Chronic toxicity

Answer: B

**Question 62**

Which one of these elements is NOT considered an essential trace element for the biosphere ?

- A Molybdenum
- B Sodium
- C Zinc
- D Selenium

Answer: B

**Question 63**

The term epicentre is associated with

- A Folding
- B Earth's interior
- C Faulting
- D Earthquakes

Answer: B

**Question 64**

How many countries participated in the first Twenty-20 World Cup in South Africa ?

- A 16
- B 22
- C 32
- D 28

Answer: A

**Question 65**

Which one among the following is the National Fruit ?

- A Apple
- B Mango
- C Banana
- D Jack Fruit

**Answer: B**

**Question 66**

Which language is spoken by maximum number of people in the world?

- A Spanish
- B Urdu
- C English
- D Chinese

**Answer: D**

**Question 67**

Name the dome shaped monument used to keep Buddhist relics.

- A Viharas
- B Temples
- C Stupa
- D Chaityas

**Answer: C**

**Question 68**

'KIMONO' is a dress style of

- A China
- B Nepal
- C Korea
- D Japan

**Answer: D**

**Question 69**

Which one of the following famous monuments was built to honour the visit of King George V and Queen Mary to India ?

- A Victoria Terminus
- B War Memorial

C The Gateway of India

D India Gate

Answer: C

Question 70

Tulsidas was the author of

A Adi Granth

B Sursagar

C Bhagavata Purana

D Ramcharitmanas

Answer: D

Question 71

The study of coins is called

A Historiography

B Numismatics

C Epigraphy

D Archaeology

Answer: B

Question 72

Which among the following is not a classical Indian dance?

A Manipuri

B Bharatanatyam

C Rasleela

D Odissi

Answer: C

Question 73

The colour of potassium flame through double blue glass is

A Violet

B Crimson red

C Golden yellow

D Green

Answer: B

**Question 74**

**Precipitation takes place when product of concentration of ions**

- A Is less than the solubility product
- B Is negligible
- C Equals the solubility product
- D Exceeds the solubility product

**Answer: D**

**Question 75**

**Dry ice is**

- A Liquified Nitrogen
- B Liquified  $H_2$
- C Solid  $CO_2$
- D Ice dust

**Answer: C**

**Question 76**

**Poisoning of drinking water is caused due to presence of**

- A Iron compound
- B Magnesium compound
- C Zinc compound
- D Arsenic compound

**Answer: D**

**Question 77**

**Which institute is known as apex body for development of agriculture ?**

- A NABARD
- B IFCI
- C Land Development Bank
- D IDBI

**Answer: A**

**Question 78**

**The duration for which a patent right is valid is known as**

- A Patent life

- B Patent duration
- C Patent time
- D Patent right

Answer: A

**Question 79**

The concept of supply curve as it is used in economic theory is relevant only for the case of

- A Monopolistic competition
- B Oligopoly
- C Monopoly
- D Perfect or pure competition

Answer: D

**Question 80**

When the prices of two goods tend to vary inversely, they are said to be

- A Pure goods
- B Economic goods
- C Substitutes
- D Complements

Answer: D

**Question 81**

Purchase of cycle by a Household is treated as

- A Consumption
- B Asset creation
- C Capital formation
- D Savings

Answer: A

**Question 82**

In a Unitary Government, the States derive their powers from

- A Central Government
- B Judiciary
- C Constitution
- D Parliament

Answer: A



**Question 83**

The theory of natural rights was first enunciated by

- A Hobbes
- B Rousseau
- C John Locke
- D Hugo Grotius

**Answer: D**

**Question 84**

Individualism is also known as

- A Anarchism
- B Communism
- C Socialism
- D Laissez-Faire

**Answer: D**

**Question 85**

Parliamentary Government is called

- A Congressional executive
- B Cabinet executive
- C Fixed executive
- D Non-responsible executive

**Answer: B**

**Question 86**

Fundamental Duties were laid down by

- A The Original Constitution
- B 42<sup>nd</sup> Amendment
- C 39<sup>th</sup> Amendment
- D 40<sup>th</sup> Amendment

**Answer: B**

**Question 87**

Simon Commission was boycotted because

- A It did not visit India

- B It was composed of conservatives
- C It was composed of inexperienced men
- D It was an all White Commission

Answer: D

**Question 88**

**The Nayanars belonged to the**

- A Shiva cult
- B Jain cult
- C Bhagavath cult
- D Vaishnava cult

Answer: A

**Question 89**

**Name the Sufi Saint with whom Akbar, the Mughal Emperor, is associated:**

- A Shaikh Nizamuddin Auliya
- B Shaikh Salim Chishti
- C Shaikh Farid
- D Shaikh Muinuddin Chishti

Answer: B

**Question 90**

**The Vaisheshika School of Physics propounded the atomic theory during the period of**

- A Harsha
- B Ashoka
- C Mauryas
- D Guptas

Answer: D

**Question 91**

**Who set up a separate department called the Diwan-i-Khairat?**

- A Muhammad-bin-Tughlaq
- B Firoz Tughlaq
- C Sher Shah
- D Akbar

Answer: B

**Question 92**

**Birmingham is an Industrial Centre of**

- A The Pittsburg-Lake Erie region
- B Volge region
- C The Midlands
- D The Keihin region

**Answer: C**

**Question 93**

**Acrescent shaped sand dune is known as**

- A Barkhan
- B Sandbar
- C Seif
- D Zeugen

**Answer: A**

**Question 94**

**Which is an ore of dolomite?**

- A Aluminium
- B Magnesium
- C Copper
- D Lead

**Answer: B**

**Question 95**

**Stalactites and stalagmites are found mainly in**

- A underground coal mines
- B sandstone regions
- C granite regions
- D limestone regions

**Answer: D**

**Question 96**

**Which one of the following is the oldest and deepest fresh waterlake in the world?**

- A Lake Baikal

- B Lake Chilka
- C Lake Superior
- D Lake Titicaca

**Answer: A**

**Question 97**

**Which one of the following plants shows vivipary?**

- A Rhizophora
- B Mango
- C Pinus
- D Litchi

**Answer: A**

**Question 98**

**The kind of inflorescence in sunflower is**

- A Capitulum
- B Raceme
- C Spadix
- D Spike

**Answer: A**

**Question 99**

**Moulting in insects is mainly controlled by**

- A Parathormone
- B Ecdysone
- C Ecotone
- D Parahormone

**Answer: B**

**Question 100**

**Silver fish is included in the phylum**

- A Chordata
- B Arthropoda
- C Annelida
- D Echinodermata

**Answer: B**

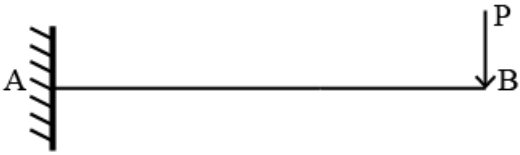
## General Engineering (Mechanical)

### Instructions

For the following questions answer them individually

### Question 101

The strain energy stored in a cantilever beam loaded as shown, will be



A  $\frac{P^2 l^3}{4EI}$

B  $\frac{P^2 l^3}{3EI}$

C  $\frac{P^2 l^3}{2EI}$

D  $\frac{P^2 l^3}{6EI}$

Answer: D

### Question 102

The torque producing a unit twist in a shaft of unit length is

A Nominal torque

B Maximum torque

C Torsional rigidity

D Normal torque

Answer: C

### Question 103

Mass per unit of the belt of an open belt drive is  $1.5 \frac{kg}{m}$ . if the linear velocity of the belt is 10m/s and radius of driving pulley 0.5m, centrifugal tension in the belt is

A 150 N

B 600 N

C 400 N

D 300 N

Answer: A

### Question 104

For a Helical spring, spring index is

A The ratio of the mean coil diameter to the pitch of helix

- B The ratio of the mean wire diameter to the pitch of helix
- C The difference between the mean coil diameter and the wire diameter
- D The ratio of mean coil diameter to wire diameter

Answer: D

**Question 105**

Rankine formula (for a column) takes into account which of the following ?

- A The initial curvature of the column
- B The eccentricity of loading
- C The effect of direct of slenderness ratio
- D The effect of slenderness ratio

Answer: C

**Question 106**

A circular shaft of length  $L$  and diameter  $D$  is fixed in one end. The other end of the shaft is subjected to a twisting moment  $T$ . the angle of rotation of the free end with respect to the fixed end is  $\theta$ . What will be the angle of rotation of the free end if length is doubled and diameter is reduced to  $\frac{D}{2}$  ?

- A  $2\theta$
- B  $16\theta$
- C  $32\theta$
- D  $\frac{\theta}{2}$

Answer: C

**Question 107**

Two simply supported beam A and B has the same length  $L$  and subjected to equal bending moment  $M$ . the stress induced in the beam A and B are  $\sigma_A$  and  $\sigma_B$  respectively. If the cross section of beam A is  $b \times b/2$  and that of beam B is  $\frac{b}{2} \times b$ , then correct relation between  $\sigma_A$  and  $\sigma_B$  is

- A  $\sigma_A = 2\sigma_B$
- B  $\sigma_A = \frac{\sigma_B}{2}$
- C  $\sigma_A = \frac{\sigma_B}{4}$
- D  $\sigma_A = \sigma_B$

Answer: A

**Question 108**

In a tensile test of a specimen, the ratio of maximum load to the original cross-section area of the test piece is called

- A Ultimate stress
- B Safe stress

- C Breaking stress
- D Yield stress

Answer: A

**Question 109**

**Which one of the following assumptions in the theory of pure torsion is false ?**

- A The Twist is uniform along the lengths.
- B The shaft is of uniform circular section throughout.
- C Cross-section plane before torsion remain plane after torsion
- D All radius get twisted due to torsion

Answer: A

**Question 110**

**If a beam supported on more than two supports, is called a**

- A Continuous beam
- B Simply supported beam
- C Encastered beam
- D Built-in beam

Answer: A

**Question 111**

**If a beam of constant section is subjected throughout its length to a uniform bending moment, it will bend to**

- A A circular arc
- B A triangular shape
- C A catenary
- D A parabolic curve

Answer: A

**Question 112**

**Fusible plug for a steam boiler is an alloy consisting of bismuth, lead out**

- A Tin
- B Copper
- C Aluminium
- D Zinc

Answer: A

**Question 113**

The maximum efficiency that a heat engine operating between  $327^{\circ}\text{C}$  and  $27^{\circ}\text{C}$  can be

- A  $\frac{3}{4}$
- B  $\frac{1}{3}$
- C  $\frac{1}{2}$
- D  $\frac{1}{4}$

**Answer: C**

**Question 114**

Which of the following gases has the highest value of characteristic gas constant (R)?

- A Nitrogen
- B Carbon Dioxide
- C Sulphur Dioxide
- D Oxygen

**Answer: A**

**Question 115**

The Molecular kinetic energy of a gas is proportional to

- A  $T^{\frac{1}{2}}$
- B  $T^{\frac{3}{2}}$
- C  $T^2$
- D  $T$

**Answer: D**

**Question 116**

Which aspect does not pertain to a free expansion process?

- A Work done is zero
- B Pressure remains constant
- C No change in the temperature of the system
- D No gain or loss of heat

**Answer: B**

**Question 117**

The isentropic expansion of initially superheated steam through the nozzle may approximately be given by the equation

- A  $PV^{1.2} = \text{const}$



B  $PV^{1.135} = \text{const}$

C  $PV^{1.3} = \text{const}$

D  $PV = \text{constant}$

Answer: B

**Question 118**

When neither mass nor energy is allowed to cross the boundary of a system, it is then called

A Open system

B Isolated system

C Universe

D Closed system

Answer: B

**Question 119**

Which of the following entities is not a thermodynamic property?

A Temperature

B Specific volume

C Heat

D Pressure

Answer: C

**Question 120**

Of the following "path function" quantity is

A Temperature

B Work done

C Enthalpy

D Pressure

Answer: B

**Question 121**

Relation  $ds = \frac{\delta Q}{T}$  is good in case of

A Irreversible process only

B Does not depend on the reversibility or irreversibility

C All real processes

D Reversible processes only

Answer: D

**Question 122**

During throttling which thermodynamic property does not change?

- A Pressure
- B Entropy
- C Enthalpy
- D Internal energy

**Answer: C**

**Question 123**

The internal energy of a perfect gas depends on

- A Temperature, enthalpy and specific heats
- B Temperature, entropy and specific heats
- C Temperature only
- D Temperature, Pressure and specific heats

**Answer: C**

**Question 124**

During an adiabatic process, the pressure  $P$  of a fixed mass of an ideal gas changes by  $\Delta P$  and its volume  $V$  changes by  $\Delta V$ . The value of  $\frac{\Delta V}{V}$  is given by

- A  $-\gamma \frac{\Delta P}{P}$
- B  $\frac{1}{\gamma} \frac{\Delta P}{P}$
- C  $\frac{1}{\gamma^3} \frac{\Delta P}{P}$
- D  $\frac{\Delta P}{P}$

**Answer: A**

**Question 125**

The ratio of air required for complete combustion of carbon dioxide and that to carbon monoxide is

- A 0.5
- B 2.0
- C 4.0
- D 1

**Answer: B**

**Question 126**

In case of Boyle's law, if pressure increases by 1% the percentage decrease in volume is

- A  $\frac{1}{101}\%$

B  $\frac{100}{101}\%$

C  $\frac{1}{100}\%$

D 0 %

**Answer: B**

**Question 127**

**Critical pressure is the pressure of steam at**

A Throat of steam nozzle

B Exit of steam nozzle

C Either at inlet or at outlet of steam nozzle

D Inlet of steam nozzle

**Answer: B**

**Question 128**

**A compression ignition engine is a**

A Steam engine

B Diesel engine

C Steam turbine

D Petrol engine

**Answer: B**

**Question 129**

**In diesel engine, the ignition takes place**

A Automatically due to high temperature of compressed fuel

B Carburettor

C Automatically due to high temperature of compressed Air

D by spark plug

**Answer: C**

**Question 130**

**The petrol engine works on**

A joule cycle

B Rankine cycle

C Carnot cycle

D Otto cycle

**Answer: D**

**Question 131**

Process in thermodynamic cycles are

I : Isentropic II : Constant Volume

III: Constant pressure IV : Isothermal

Which process of is/are not involved in an air standard dual combustion cycle?

A II and III only

B I only

C IV only

D I and II only

**Answer: C**

**Question 132**

Morse test is conducted on multi cylinder engine to find the engine's

A Indicated power

B Stroke length

C Emission performance

D Compression ratio

**Answer: A**

**Question 133**

A nozzle is said to be choked when

A Flow through it is maximum and exit pressure is critical pressure

B it discharge flow into the atmosphere

C It gets plugged

D Flow through it becomes zero and exit pressure is zero

**Answer: A**

**Question 134**

In a water-tube boiler, the flue gas flows through the following accessories :

1. Super heater 2. ID fan

3. Air heater 4. Economizer

Which of the following gives, the correct sequences of the flue gas through these accessories:

A 1, 2, 3, 4

B 3, 1, 4, 2

C 1, 4, 3, 2

D 1, 3, 2, 4

**Answer: C**

**Question 135**

Lean air fuel mixture is required for

- A Idling
- B Crushing
- C Acceleration
- D Starting

**Answer: C**

**Question 136**

What material is used for the insulating body of a spark plug?

- A Alumina
- B Dolomite
- C Glass
- D Silica

**Answer: A**

**Question 137**

Which element regulates the pressure strokes in the fuel injection pump of a diesel engine?

- A Control rack
- B Pump shaf
- C Lift of plunge
- D Needle valve

**Answer: A**

**Question 138**

For complete specification of super heated vapour, one needs

- A Temperature
- B Pressure as well as temperature
- C Specific volume
- D Pressure

**Answer: B**

**Question 139**

Safety valve used with locomotive boilers is operated by

- A Spring
- B Dead weight

C High steam and low water

D Lever

Answer: D

**Question 140**

Behaviour of which of the following steam quantities is closest to that of a gas?

A Dry

B Wet or Dry

C Super heated

D Wet

Answer: C

**Question 141**

A carnot engine uses nitrogen as the working fluid. The heat supplied is 53 kJ and adiabatic expansion ratio is 16 : 1 The receiver temperature is 295 K. The heat rejected is kJ is

A 20.50

B 230

C 27.75

D 17.49

Answer: D

**Question 142**

In a centrifugal pump, the liquids enters the pump

A At the bottom

B At the center

C From the sides

D At the top

Answer: E

**Question 143**

for a fluid at rest

A The shear stress is zero

B The shear stress is zero only on the horizontal plane

C The shear stress is maximum on a plane inclined at  $45^\circ$  to the horizontal

D The shear stress depends upon the co-efficient of viscosity

Answer: B

**Question 144**

**A pelton wheel is**

- A Radial flow impulse turbine
- B Inward flow impulse turbine
- C Axial flow impulse turbine
- D Outward flow impulse turbine

**Answer: B**

**Question 145**

**One torr pressure is equivalent to**

- A 1 atmosphere
- B 1 mm of mercury
- C 10 meter of water
- D 1 Pascal

**Answer: B**

**Question 146**

**Which one of the following is the Bulk Modulus K of fluid?**

- A  $\frac{dp}{\rho \, d \rho}$
- B  $\frac{\rho \, d \rho}{dP}$
- C  $\frac{d \rho}{\rho \, dP}$
- D  $\frac{\rho \, dP}{d \rho}$

**Answer: D**

**Question 147**

**Centrifugal pump is started with its delivery valve is**

- A Kept fully open
- B Kept 50% open
- C Irrespective of any position
- D Kept fully closed

**Answer: D**

**Question 148**

**In flow through a pipe, the transition from Laminar to turbulent does not depends on**

- A Density of the fluids
- B Length of the pipe

C Diameter of the pipe

D Velocity of the fluid

Answer: B

Question 149

Pick up the wrong statement about Centrifugal Pump

A Power is proportional to speed<sup>2</sup>

B Head is proportional to Diameter<sup>2</sup>

C Discharge is proportional to Diameter

D Head is proportional to Speed<sup>2</sup>

Answer: C

Question 150

A pipe flow is said to be laminar, if

A If the velocity is above 2000  $\frac{m}{min}$

B If the velocity is less than 2000  $\frac{m}{min}$

C If the flow Reynolds number is less than or equal to 2000  $\frac{m}{min}$

D There is no heat transfer

Answer: C

Question 151

The Kinetic energy associated with a jet through a cross sectional area 'a' having density  $\rho$  and velocity 'v' is

A  $\frac{1}{2} \rho a v^2$

B  $\frac{1}{2} \rho a v^3$

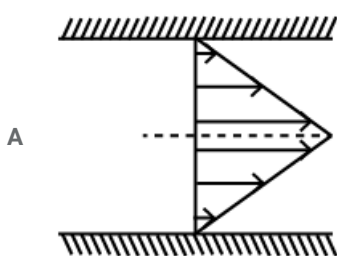
C  $\frac{1}{2} \rho a^2 v^3$

D  $\frac{1}{2} \rho v^2$

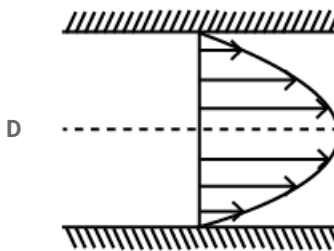
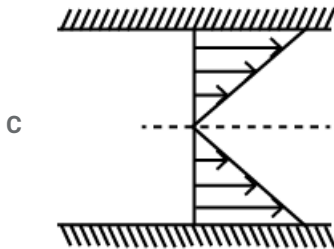
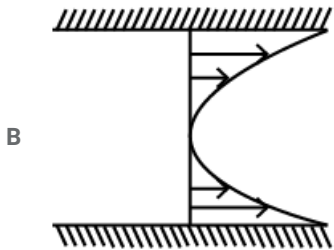
Answer: A

Question 152

Which shear stress distribution is the correct one corresponding to the flow through a pipe of circular cross-section with parabolic velocity profile?







Answer: C

Question 153

Flow through a supersonic nozzle is an example of

- A Open system
- B Isolated system
- C Insulated system
- D Closed system

Answer: A

Question 154

Loss of energy due to sudden enlargement of pipe cross-section in meters of water is given by

- A  $\frac{1}{4}(V_1 - V_2)^2$
- B  $\frac{1}{4}(V_1^2 - V_2^2)$
- C  $\frac{1}{2} V_2^2 \left(1 - \frac{A_2}{A_1}\right)^2$
- D  $\frac{1}{2} V_2^2 \left(\left(\frac{A_2}{A_1}\right)^2 - 1\right)$

Answer: C

Question 155

For maximum power transmission through a pipe line, the friction head loss equals

- A  $\frac{H}{3}$

B  $\frac{H}{2}$

C  $3\frac{H}{5}$

D  $\frac{H}{4}$

Answer: A

**Question 156**

What should be the ratio of jet speed to blade speed for maximum efficiency of a pelton wheel?

A  $\frac{1}{6}$

B  $\frac{3}{4}$

C  $\frac{1}{4}$

D  $\frac{1}{2}$

Answer: D

**Question 157**

Pressure of 80 kPa is equivalent to a head in meter of carbon tetrachloride of relative density 1.59 of the value

A 6.71 m

B 9.43 m

C 5.13 m

D 8.32 m

Answer: C

**Question 158**

Two pipe systems are said to be equivalent when in two systems

A Length of pipe and discharge are same

B Friction factor and length are same

C Length and diameter are same

D Head loss and discharge are same

Answer: A

**Question 159**

Flow between an two stream lines

A Remains the same

B Increases along its path

C Decreases along its path

D Is always Zero

Answer: A

**Question 160**

**Pseudo-plastic substances are non-Newtonian fluids for which**

- A Dynamic viscosity increases as the rate of shear increases
- B Dynamic viscosity decreases with the time for which shearing forces applied
- C Dynamic viscosity increases with the time for which shearing forces applied
- D Dynamic viscosity decreases as the rate of shear increases

**Answer: D**

**Question 161**

**For helical gears, the helix angle generally ranges from**

- A 30 to 45 degrees
- B 45 to 60 degrees
- C 30 to 75 degrees
- D 0 to 30 degrees

**Answer: A**

**Question 162**

**Which of the following is not a foundry tool?**

- A Riddle
- B Arbor
- C Slick
- D Trowel

**Answer: B**

**Question 163**

**Filler metal is used in**

- A Spot welding
- B Projection welding
- C Gas welding
- D Seam welding

**Answer: C**

**Question 164**

**Hot working of metal is carried out**

- A Above the recrystallisation temperature

- B At the recrystallisation temperature
- C Working Temperature depends upon physical condition of work piece
- D Below the recrystallisation temperature

Answer: A

**Question 165**

The vertical passage for bringing molten metal to mould cavity is called

- A Riser
- B Sprue
- C Runner
- D Gate

Answer: B

**Question 166**

In arc welding, the arc length should be approximately equal to

- A Diameter of electrode rod
- B One and a half time the diameter of electrode rod
- C Twice the diameter of the electrode rod
- D Half the diameter of the electrode rod

Answer: A

**Question 167**

The forging of the steel specimen is normally done at a temperature of

- A  $800^{\circ}\text{C}$
- B  $1100^{\circ}\text{C}$
- C  $1500^{\circ}\text{C}$
- D  $400^{\circ}\text{C}$

Answer: A

**Question 168**

Which part of the cutting tool is prone to crater wear?

- A Face
- B Shank
- C Base
- D Flank

Answer: A

**Question 169**

**The size of a Shaper is specified by**

- A Gross weight off machine
- B Surface area that can be machined in one hour
- C Quick return ratio
- D Maximum travel of cutting tool

**Answer: D**

**Question 170**

**The process of pouring molten metal in the cavity of a metallic mould by gravity is known as**

- A Permanent mould casting
- B Pressed Casting
- C Shell Casting
- D Die Casting

**Answer: A**

**Question 171**

**The Soldering Iron is heated in a gas flame until**

- A The bit is the red hot
- B The coating of borax on the bit turns black
- C The gas flame appears orange in the color
- D The gas flame appears Green in the color

**Answer: A**

**Question 172**

**Cupola is best suited for melting**

- A Non-ferrous metals
- B Aluminium alloys
- C Alloys of copper
- D Ferrous metals

**Answer: D**

**Question 173**

**Railway rails are generally made of**

- A High Carbon steel

- B Medium carbon steel
- C Alloy steel containing 0.8 to 0.9 % carbon
- D Mild steel

**Answer: D**

**Question 174**

**In case of slotting machine, cutting action takes place in**

- A Forward stroke
- B Downward stroke
- C Backward stroke
- D Upward stroke

**Answer: A**

**Question 175**

**In a drill operation**

- A Torque is equal to the axial force
- B Torque is more than the axial force
- C Torque is less than the axial force
- D Torque is half the axial force

**Answer: D**

**Question 176**

**Lathe bed is made of**

- A Cast Iron
- B Alloy steel
- C High Carbon steel
- D Mild steel

**Answer: A**

**Question 177**

**While using High speed steel tools on lathe, the speed of chuck will be lowest while machining**

- A Copper
- B Aluminium
- C Brass
- D Cast Iron

**Answer: D**

**Question 178**

When turning Mild steel, if the area of cross-section of the cut remain constant, the cutting force will be minimum if depth of cut is

- A Approximately equal to the feed per revolution
- B One-and-half time the feed per revolution
- C Two time the feed per revolution
- D Half the feed per revolution

**Answer: D**

**Question 179**

In which type of welding molten metal is poured for joining the metals?

- A Arc Welding
- B Gas welding
- C MIG welding
- D Thermit welding

**Answer: D**

**Question 180**

In a single V-butt welds the angle between edges is kept about

- A  $20^\circ$  to  $40^\circ$
- B  $40^\circ$  to  $60^\circ$
- C  $70^\circ$  to  $90^\circ$
- D  $10^\circ$  to  $20^\circ$

**Answer: A**

**Question 181**

Permeability of a foundry sand is

- A Porosity to permit the escape of gases/air
- B Fineness of sand
- C Distribution of binder in sand
- D Capacity to hold moisture

**Answer: A**

**Question 182**

The crank radius of a slider crank mechanism is 10cm. If the crank radius is increased to 12cm. the stroke length will increase by

- A 10%

- B 20%
- C 12%
- D 5%

Answer: B

**Question 183**

**Assertion (A) :**A clutch is the best means to connect a driving shaft with a driven shaft for regular power transmission

**Reason (R):**

A clutch can be frequently engaged and disengaged at operators will

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

Answer: D

**Question 184**

A spur gear with pitch circle diameter D has number of teeth T. The module m is defined as

- A  $m = \frac{D}{T}$
- B  $m = DT$
- C  $m = \frac{T}{D}$
- D  $m = TD$

Answer: A

**Question 185**

A ball and socket joint forms a

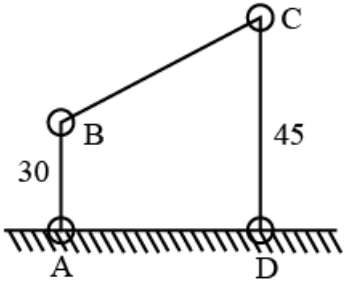
- A Rolling pair
- B Sliding pair
- C Spherical pair
- D Turning pair

Answer: C



Question 186

BCD is a four-bar mechanism in which AB = 30 cm and CD = 45 cm. At an instant, both AB and CD are perpendicular to fixed link AD. If velocity of B at this condition is V, then velocity of C is



A  $\frac{4}{3} V$

B  $\frac{9}{4} V$

C  $\frac{3}{2} V$

D V

Answer: C

Question 187

The inner and outer radius of friction surface of a plate clutch are 50 mm and 100 mm respectively. What is the ratio of maximum intensity of pressure on clutch plate if magnitude of axial force is 4 kN? Assume uniform wear theory

A 4

B 2

C 6

D 8

Answer: B

Question 188

The thickness of a boiler plate is 16mm, the diameter of rivet used in the boiler joint is

A 24 mm

B 28 mm

C 10 mm

D 20 mm

Answer: A

Question 189

Lewis equation in spur gear design is applied to

A Gear

B Stronger of the pinion or gear

C Weaker of the pinion or gear

D Pinion

Answer: C

Question 190

Degree of freedom of a slider crank mechanism is

A 1

B 2

C 3

D 0

Answer: A

Question 191

Match the List-I with list-II and select the correct match using the codes below

**List-I**

A. Governor

B. Flywheel

C. Critical speed

D. Inertia force

**List-II**

1. Dunkerley method

2. turning moment

3. D's Alembert's principle

4. Speed control

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

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

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

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

Answer: C

Question 192

The reaction between number of lower pair(P) and number of links (L) in a four link kinematic chain is given by

A  $L = p + 4$

B  $L = 2p + 4$

C  $L = 2(p - 1)$

D  $L = 2p - 4$

Answer: D

Question 193

The stiffness of the spring in a hartnell governor is equal to  $\frac{S_1 - S_2}{h}$  = Spring force exerted on the sleeve at maximum radius of rotation  $S_2$  = Spring force exerted on the sleeve at minimum radius of rotation

A  $\frac{2(S_1 - S_2)}{h}$

B  $\frac{S_{1-} - S_{2}}{2h}$

C  $\frac{S_{1-} + S_{2}}{h}$

D  $\frac{S_{1-} - S_{2}}{h}$

Answer: D

**Question 194**

The differential gear in the automobiles is used to

A Help in turning

B Assist in changing speed

C Provide balancing

D Reduce speed

Answer: A

**Question 195**

Which of the following gear system have minimum axial thrust?

A Bavel gears

B Helical gears

C Double helical gears

D Spur gears

Answer: C

**Question 196**

A sliding bearing which can support steady loads without any relative motion between the journal and the bearing is called

A Boundary lubricated bearing

B Zero film bearing

C Hydrodynamic lubricated bearing

D Hydrostatic lubricated bearing

Answer: C

**Question 197**

Form the Lewis equation  $F_b = f.p.y.b$ , the strength factor of the gear is given by the product

A f.y

B p.y

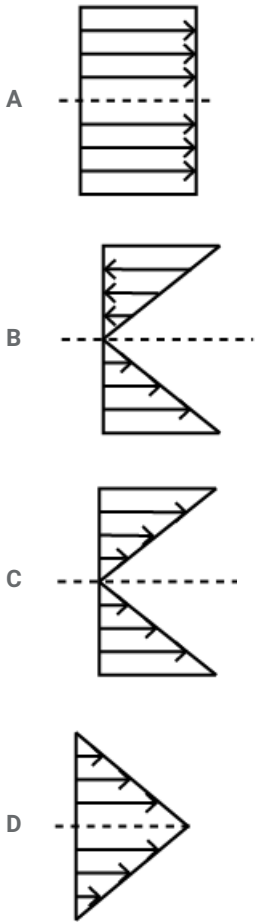
C p.b

D f.b

Answer: A

Question 198

A simply supported beam is subjected to a point load P at the middle of the beam. The correct normal stress distribution across its cross-section is given by which figure?



Answer: B

Question 199

The shear strength, tensile strength and, compressive strength of rivet joint are 100N, 120N and 150N respectively. If strength of the unriveted plate is 200N, the efficiency of rivet joint is

- A 60%
- B 75%
- C 80%
- D 50%

Answer: D

Question 200

a simply supported beam carries a uniformly distributed load of w kgf per unit length over the whole span (l) the shear force at the center is

- A  $\frac{wl^2}{8}$
- B  $\frac{wl}{8}$
- C 0

D  $\frac{w}{2}$

Answer: C

