



## SSC JE Mechanical Engineering 2013

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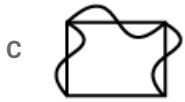
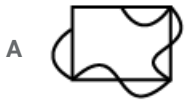
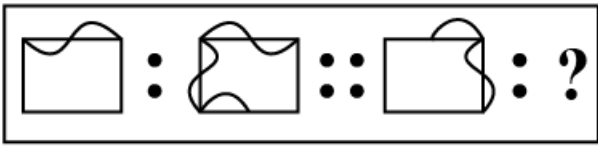
# General Intelligence and Reasoning

## Instructions

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

### Question 1

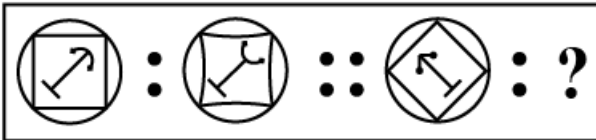
Question figures:



Answer: C

### Question 2

Question figures:



Answer: C

Question 3

Question figures:



Answer: A

Question 4

23 : 8 :: 32 : ?

A 6

B 9

C 17

D 27

Answer: B

Question 5

MLKJ : NOPQ :: IHGF : ?

A UTSR

B RSTU

C SRUT

D UTRS

Answer: B

Question 6

ACEG : ZXVT :: BDFH : ?

- A YWUS
- B YXWV
- C YWVT
- D YXVW

Answer: A

**Question 7**

BADC : XWZY :: FEHG : ?

- A VXRT
- B TSVU
- C YXCV
- D VSXW

Answer: B

**Question 8**

5 : 7 :: 10 : ?  
9 : 13 :: 19 : ?

- A  $\frac{14}{26}$
- B  $\frac{14}{27}$
- C  $\frac{14}{23}$
- D  $\frac{14}{25}$

Answer: B

**Question 9**

3 : 9 :: 6 : ?

- A 14
- B 18
- C 17
- D 16

Answer: B

**Instructions**

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

**Question 10**

- A 7 - 145
- B 6 - 108

C 5 - 75

D 4 - 48

**Answer: A**

**Question 11**

A Mars

B Jupiter

C Earth

D Comet

**Answer: D**

**Question 12**

A Geeta

B Quran

C Bible

D Mahabharat

**Answer: D**

**Question 13**

A Message

B Information

C Matter

D Material

**Answer: D**

**Question 14**

A Guitar

B Veena

C Flute

D Sitar

**Answer: C**

**Question 15**

A 17 - 142

B 71 - 34

C 41 - 28

D 14 - 28

Answer: D

Question 16

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

Answer: D

Question 17

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

Answer: B

Question 18

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

Answer: C

Instructions

For the following questions answer them individually

Question 19

Arrange the ee words Soeen order :

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

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

Answer: D

Question 20

Which will appear fourth in the dictionary ?

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

**Answer: C**

**Question 21**

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

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

**Answer: A**

**Question 22**

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

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

**Answer: D**

**Instructions**

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

**Question 23**

?, PSV, EHK, TWZ, ILO

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

**Answer: D**

**Question 24**

78, 86, ?, 88, 82, 90

- A 76

B 84

C 83

D 80

Answer: D

Question 25

3 7 13 ? 31 43 57

A 51

B 81

C 41

D 21

Answer: D

Question 26

EJOT, INSX, AFKP, ?

A CHMS

B XTOJ

C BGLQ

D EJOT

Answer: C

Instructions

For the following questions answer them individually

Question 27

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

A 6

B 4

C 7

D 5

Answer: B

Question 28

Find the wrong number in the given series.

3, 7, 15, 31, 64, 127

A 127

B 64



C 31

D 3

Answer: B

**Question 29**

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

A 46 km/hr

B 48 km/hr

C 50 km/hr

D 60 km/hr

Answer: B

**Question 30**

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

A GRTULTEANOC

B GNCOUTRAETLA

C GNOCUTARETAL

D GLNAOTCEURTA

Answer: B

**Question 31**

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

A S2V2RV

B S2U2RU

C S2U2TU

D S2V2TV

Answer: C

**Question 32**

Some equations are solved on the basis of a certain system. On the same basis, find out the correct answer for the unsolved equation. If  $4^2 = 7$ ,  $5^2 = 7$ ,  $6^2 = 9$ , then  $7^2 = ?$

A 14

B 13

C 10

D 8

Answer: B

**Question 33**

Find out the number which belongs to the given group of numbers from the alternatives:

246, 579, 135, 35, 68

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

Answer: B

**Question 34**

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

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

Answer: A

**Question 35**

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

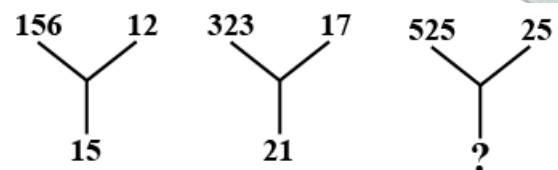
- A PANIC
- B COME
- C COMB
- D PAIN

Answer: C

**Instructions**

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

**Question 36**



- A 43
- B 17
- C 23

D 87

Answer: C

Question 37

6	11	25
8	6	16
?	5	16

A 10

B 14

C 12

D 16

Answer: B

Instructions

For the following questions answer them individually

Question 38

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

A 8 ft

B 6 ft

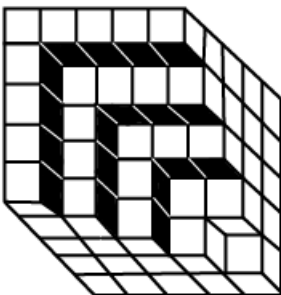
C 4 ft

D 2 ft

Answer: D

Question 39

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



A 75

B 55

C 25

D 16

Answer: B

Question 40

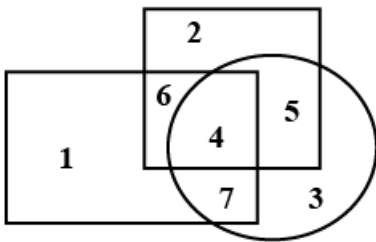
The door of Priya's house faces East. From the back side of the house, she walks straight 50 meters, then turns to the right and walks 50 meters again. Finally, she turns towards the left and stops after walking 25 meters. Now Priya is facing which direction ?

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

Answer: B

Question 41

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

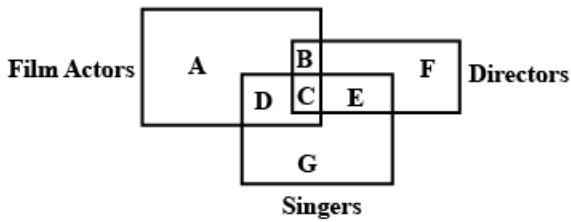


- A 5
- B 4
- C 6
- D 7

Answer: B

Question 42

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



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

Answer: A

Question 43

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

Question figure:



Answer: D

Instructions

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

Question 44

Statement :

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

Conclusions :

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

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

A Only conclusion I follows

B Only conclusion II follows

C Neither conclusion I nor II follows

D Both conclusions I and II follow

Answer: B

Question 45

Statements:

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

Conclusions:

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

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

Answer: C

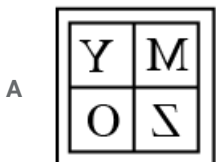
Instructions

For the following questions answer them individually

Question 46

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

Question figure:



Answer: C

Question 47

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

**Matrix I**

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

**Matrix II**

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

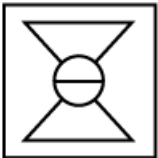
- A 12, 30, 87, 41, 66, 83
- B 99, 30, 87, 77, 23, 44
- C 55, 01, 87, 98, 34, 87
- D 40, 30, 87, 89, 24, 43

Answer: A

Question 48

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

Question figure:





Answer: D

Question 49

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

*Question figure:*

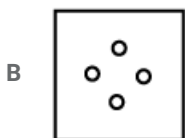
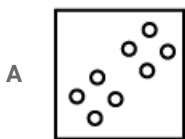
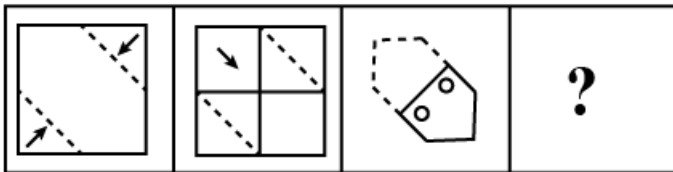


Answer: B

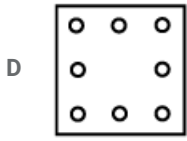
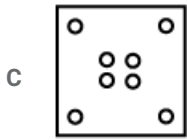
Question 50

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

*Question figure:*







Answer: A

## General Awareness

### Instructions

For the following questions answer them individually

### Question 51

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

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

Answer: B

### Question 52

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

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

Answer: C

### Question 53

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

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

Answer: D

### Question 54

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

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

**Answer: D**

**Question 55**

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

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

**Answer: D**

**Question 56**

**The characteristic feature of democratic socialism is**

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

**Answer: C**

**Question 57**

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

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

**Answer: B**

**Question 58**

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

- A Locke
- B Aristotle
- C Marx

D Rousseau

Answer: D

**Question 59**

**A civil servant in India may exercise poliliberty by**

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

Answer: D

**Question 60**

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

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

Answer: C

**Question 61**

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

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

Answer: C

**Question 62**

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

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

Answer: A

**Question 63**

**What type of fruit is pineapple?**

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

Answer: B

**Question 64**

**Strobilus is a structure associated with**

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

Answer: C

**Question 65**

**Signet-ring is seen in the life cycle of**

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

Answer: B

**Question 66**

**The number of occipital condyles in man is**

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

Answer: B

**Question 67**

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

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

D Loeffler's syndrome

Answer: D

Question 68

Which of the following animals is an osmoconformer ?

A Hagfish

B Seal

C Whale

D Rohu

Answer: A

Question 69

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

A Nuclear fission

B Nuclear fusion

C Artificial radioactivity

D X-ray emission

Answer: B

Question 70

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

A Thomson

B Millikan

C Rutherford

D Coulomb

Answer: B

Question 71

The first Muslim king who invaded South India was

A Balban

B Mohammad bin Tughlaq

C Babar

D Alauddin Khilji

Answer: D

Question 72

The Great Bath was located in

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

Answer: B

**Question 73**

**The Mughal judicial system was based on**

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

Answer: C

**Question 74**

**Hurricanes are generally**

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

Answer: A

**Question 75**

**Orinoco oil belt is in**

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

Answer: C

**Question 76**

**The highest peak in Africa is**

- A Aconcagua
- B Kilimanjaro
- C McKinley

D Mount Elbrus

Answer: B

Question 77

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

A Sial

B Sima

C Mantle

D Nife

Answer: C

Question 78

The exhaustion of soil fertility is the result of

A Cover cropping

B Multiple cropping

C Rotation cropping

D Over cropping

Answer: D

Question 79

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

A Transfusion

B Vaccination

C Inoculation

D Intimation

Answer: B

Question 80

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

A Rousseau

B Karl Marx

C Chanakya

D Montesquieu

Answer: B

Question 81

When and where will the next Olympics be held ?

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

**Answer: C**

**Question 82**

**A Persian form of singing a poem is called**

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

**Answer: A**

**Question 83**

**Green-house effect causes**

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

**Answer: A**

**Question 84**

**The advantages of rain-water harvesting is that it**

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

**Answer: D**

**Question 85**

**The 'solder' used for connecting electronic circuits consists of**

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



D Lead and Aluminium

Answer: A

Question 86

What type of molecular motion is responsible for heat conduction ?

A Translational

B Vibrational

C Rotational

D Spin

Answer: B

Question 87

Pick the odd one out.

A Compiler

B Interpreter

C Assembler

D Word processor

Answer: D

Question 88

MS-Office is an example of .....

A an operational system

B a telecommunication software

C a programming language

D a productivity software

Answer: D

Question 89

In India, the day 5<sup>th</sup> September is celebrated as Teacher's Day to honour the birthday of

A Rabindra Nath Tagore

B Dr. S. Radhakrishnan

C Dr. Rajendra Prasad

D Mrs. Indira Gandhi

Answer: B

Question 90

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

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

Answer: B

**Question 91**

Fly ash is

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

Answer: C

**Question 92**

Addition of chlorine to raw water before treatment is known as

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

Answer: C

**Question 93**

Which of the following is not a water treatment technique ?

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

Answer: D

**Question 94**

Which one of the following is a major indoor air pollutant in India ?

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

D Sulphur dioxide

Answer: C

Question 95

Multi Drug Therapy is for the infection of

A Leprosy

B AIDS

C Cholera

D Hepatitis

Answer: A

Question 96

Volvo, the car manufacturing company, introduced

A Alarm

B Fog light

C Seat belts

D Rear view mirrors

Answer: C

Question 97

The Dark Continent is

A Asia

B Australia

C Africa

D Europe

Answer: C

Question 98

The major constitution of air is

A Nitrogen

B Carbon dioxide

C Oxygen

D Hydrogen

Answer: A

Question 99

The souring of milk to curd is an example of

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

Answer: C

**Question 100**

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

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

Answer: A

## General Engineering (Mechanical)

**Instructions**

For the following questions answer them individually

**Question 101**

Which of the following statements is not true for couplings ?

- A Couplings are meant for transmitting torque
- B Couplings keep the mating shafts in alignment
- C Couplings are used in shafts
- D Couplings connect parallel shafts

Answer: D

**Question 102**

The sum of the tensions when the belt is running on the pulley is

- A less than the initial tension
- B More than the initial tension
- C More than twice the initial tension
- D Half the initial tension

Answer: C

**Question 103**

A steel bar is fixed at both ends. If the bar is heated, it will develop

- A Compressive stress

- B Tensile stress
- C Bending stress
- D None of the above

Answer: A

**Question 104**

For a screw, the angle of helix ( $\alpha$ ) is related to the lead (L) and mean screw thread diameter (d) as

- A  $\tan \alpha = \frac{L}{d}$
- B  $\tan \alpha = \frac{d}{L}$
- C  $\tan \alpha = \frac{L}{\pi d}$
- D  $\tan \alpha = \frac{\pi d}{L}$

Answer: C

**Question 105**

A slider crank chain is a four bar linkage consisting of

- A One sliding pair and two turning pairs
- B One sliding pair and three turning pairs
- C Two sliding pairs and two rotating pairs
- D Two sliding pairs and two turning pairs

Answer: B

**Question 106**

In wheel and differential axle, the velocity ratio is given by

- A  $\frac{d_1 - d_2}{2D}$
- B  $\frac{d_1 - d_2}{4D}$
- C  $\frac{2D}{d_1 - d_2}$
- D  $\frac{4D}{d_1 - d_2}$

Answer: C

**Question 107**

Acme threads are generally used in

- A Railway carriage couplings
- B Spindles of bench vices
- C Screw cutting lathes

D Feed mechanism of machine tools

Answer: C

Question 108

In a hartnell governor, 800 N force is exerted on the sleeve at minimum radius and 1200 N force is exerted at minimum radius. If sleeve lift is 20 mm, the value of spring stiffness (S) is

A 10 N/mm

B 20 N/mm

C 15 N/mm

D 18 N/mm

Answer: B

Question 109

The minimum and maximum speeds of a flywheel during a cycle are  $N_1$  and  $N_2$  r.p.m. respectively. The coefficient of steadiness of the flywheel is

A  $\frac{(N_1 - N_2)}{(N_1 + N_2)}$

B  $\frac{(N_1 + N_2)}{2(N_1 - N_2)}$

C  $\frac{2(N_1 + N_2)}{(N_1 - N_2)}$

D  $\frac{(N_1 + N_2)}{(N_1 - N_2)}$

Answer: B

Question 110

The angle of vee belts is

A  $15^\circ$

B  $30^\circ$

C  $40^\circ$

D  $45^\circ$

Answer: D

Question 111

A point on a link connecting double slider crank chain traces a/an

A Straight line path

B Circular Path

C Parabolic path

D Elliptical path

Answer: D

**Question 112**

The angular speed of a wall's governor, when its height is 20 cm, will be equal to

- A 20 rad/sec
- B 10 rad/sec
- C 6 rad/sec
- D 7 rad/sec

Answer: D

**Question 113**

The efficiency in case of worm gear drives is generally in the range of

- A 10-25 percent
- B 40-60 percent
- C 50-70 percent
- D 70-85 percent

Answer: C

**Question 114**

In a kinematic chain, the minimum number of kinematic pairs required is

- A one
- B two
- C three
- D four

Answer: D

**Question 115**

For a key to be equally strong in shearing and crushing, the width of the key, assuming that the allowable crushing stress is twice the allowable shear stress, should be

- A 2.5 times its thickness
- B 2 times its thickness
- C 1.5 times its thickness
- D equal to its thickness

Answer: D

**Question 116**

Tension in the tight side of a belt drive is 100 N and that in the slack side 60 N. If the belt breadth is 10 cm and thickness 4 cm, what is the maximum stress induced in the belt?

- A  $2.5 \text{ N/cm}^2$
- B  $1.5 \text{ N/cm}^2$
- C  $4 \text{ N/cm}^2$
- D  $2 \text{ N/cm}^2$

Answer: A

**Question 117**

If two shafts of the same length, one of which is hollow, transmit equal torques and have equal maximum stress, then they should have equal

- A Polar moment of inertia
- B Polar modulus of section
- C Diameter
- D Angle of twist

Answer: B

**Question 118**

In case of cantilever, irrespective of the type of loading the maximum bending moment and maximum shear force occur at

- A Fixed end
- B Free end
- C Middle
- D Any point

Answer: A

**Question 119**

Ratio of moment of inertia of a circle and that of a square having same area about their centroidal axis is

- A  $\frac{3}{\pi}$
- B  $\frac{3}{2\pi}$
- C  $\frac{4}{\pi}$
- D  $\frac{5}{9\pi}$

Answer: A

**Question 120**

A circular shaft can transmit a torque of 13 kN-m. If the torque is reduced to 12 kN-m, then the maximum value of bending moment that can be applied to the shaft is

- A 1 kN-m



- B 3 kN-m
- C 5 kN-m
- D 7 kN-m

Answer: C

**Question 121**

**Assertion (A):** The preferred cross-section of a beam subjected to transverse loading is I section.

**Reason (R):** Section Modulus of I section is low

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

Answer: C

**Question 122**

The value of Poisson's Ratio is always less than

- A 1
- B 0.2
- C 0.4
- D 0.5

Answer: D

**Question 123**

The spindle of a machine tool is subjected to the following type of load:

- A Torsional load
- B Bending load
- C Axial compressive load
- D Axial tensile load

Answer: A

**Question 124**

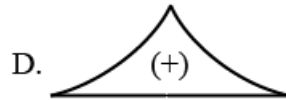
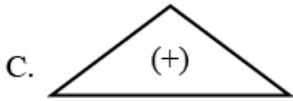
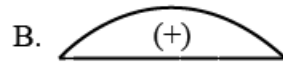
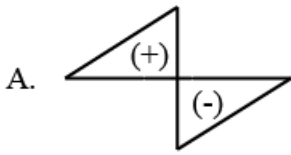
The cross-section of a member is subjected to a uniform shear. The strain energy stored per unit volume is equal to (G = modulus of rigidity)

- A  $\frac{2\tau^2}{G}$
- B  $\frac{\tau^2}{2G}$
- C  $\frac{\tau^2}{4G}$

D  $\frac{\tau^2}{G}$

Answer: B

Question 125



Figures A,B,C and D are bending moment distribution of a simply supported beam for some particular shear stress distribution. which figure is the correct bending moment diagram corresponding to the shear stress distribution given below :



A A is correct bending moment distribution

B B is correct bending moment distribution

C C is correct bending moment distribution

D D is correct bending moment distribution

Answer: C

Question 126

A uniform simply supported beam of span (l) carries a point load (W) at the Centre. The downward deflection at the centre will be

A  $\frac{Wl^2}{8EI}$

B  $\frac{Wl^3}{8EI}$

C  $\frac{Wl^2}{5384EI}$

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

Answer: C

Question 127

The power transmitted by a circular shaft rotating at N rpm under action of Torque T is:

A  $\frac{2\pi NT}{750}$

B  $\frac{2\pi NT}{60}$

C  $\frac{2\pi NT}{450}$

D  $\frac{2\pi NT}{4500}$

Answer: B

**Question 128**

A cylinder is said to be thin if the thickness to diameter ratio is less than

- A  $\frac{1}{5}$
- B  $\frac{1}{10}$
- C  $\frac{1}{15}$
- D  $\frac{1}{20}$

**Answer: D**

**Question 129**

The bending moment on a section is maximum where shearing force is

- A Minimum
- B Maximum
- C Zero
- D Changing sign

**Answer: C**

**Question 130**

Strut is defined as a

- A Member of a structure which carries a tensile load
- B Member of a structure which carries an axial compressive load
- C Vertical Member of a structure which carries a tensile load
- D Vertical Member of a structure which carries no load

**Answer: B**

**Question 131**

The expression  $\int_1^2 p dV$  gives the measure of work done during

- A Steady flow reversible process
- B Non-flow reversible process
- C Open system and any process
- D Any system and any process

**Answer: B**

**Question 132**

What approximate percentage of heat of combustion is lost to the jacket cooling water?

- A 5 %

- B 10 %
- C 15 %
- D 25 %

Answer: D

**Question 133**

If two liquids at different temperatures are mixed, then the final temperature of the mixture of liquids can be obtained by using

- A Zeroth law of thermodynamics
- B First law of thermodynamics
- C Second law of thermodynamics
- D Third law of thermodynamics

Answer: C

**Question 134**

For an irreversible thermodynamics cycle

- A  $\int \frac{dQ}{T} > 0$
- B  $\int \frac{dQ}{T} < 0$
- C  $\int \frac{dQ}{T} \geq 0$
- D  $\int \frac{dQ}{T} \leq 0$

Answer: B

**Question 135**

The enthalpy of evaporation of water

- A Decreases with increase in pressure
- B Decreases with decrease in pressure
- C Increases with increase in pressure
- D Remain unaffected by change in pressure

Answer: A

**Question 136**

In a throttling process, the following thermodynamic property remains constant:

- A Enthalpy
- B Entropy
- C Specific heat
- D Energy

Answer: A

Question 137

Heat supplied to a system equals the work done in case of non-flow process carried out

- A Isochorically
- B Isobarically
- C Isothermally
- D Adiabatically

Answer: C

Question 138

Neglecting changes in potential and kinetic energies, the shaft work during a steady flow process is given by

- A  $\int \rho dv$
- B  $\int v d\rho$
- C  $\int T ds$
- D  $\int S dT$

Answer: B

Question 139

Which property is an intensive property of the system?

- A Specific enthalpy
- B Volume
- C Kinetic energy
- D Entropy

Answer: A

Question 140

One of the extensive properties of a thermodynamic system amongst the following is

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

Answer: B

Question 141

A heat engine is supplied with 278 kW of heat at a constant fixed temperature of  $283^{\circ}\text{C}$  and the heat rejection takes place at  $5^{\circ}\text{C}$ . The engine is reversible if the heat rejected, in kW, is

- A 139
- B 208
- C 35
- D 70

**Answer: A**

**Question 142**

**Function of carburetor is to supply**

- A Air and petrol mixture
- B Air and diesel mixture
- C Only petrol
- D Petrol and diesel mixture

**Answer: A**

**Question 143**

**In a boiler, the feed check valve is used to**

- A Control the feed water flow rate
- B Check the water level in drum
- C Ensure unidirectional feed flow to drum
- D Check quality of feed water

**Answer: C**

**Question 144**

**When wet steam flows through a throttle valve**

- A Its temperature increases and dryness improves
- B Its temperature increases but dryness decreases
- C Its temperature decreases and dryness improves
- D Its temperature and dryness decreases

**Answer: C**

**Question 145**

**In internal combustion engine terminology, MPFI stands for**

- A Multi pressure Fuel Injection
- B Multi Point Fired Ignition
- C Multi Point Fuel Injection

D Multi Pressure Fired Ignition

Answer: C

Question 146

For complete burning of 1 kg of carbon, the air required will be about

A 2.67 kg

B 12.7 kg

C 11.6 kg

D 14.5 kg

Answer: C

Question 147

1ton of refrigeration is equivalent to

A 1 kW

B 2.5 kW

C 3.5 kW

D 5 kW

Answer: C

Question 148

Knocking tendency in an SI engine reduces with increasing

A Compression ratio

B Wall temperature

C Supercharging

D Engine speed

Answer: D

Question 149

Centane number of a fuel is a measure of its

A Viscosity

B Volatility

C Ignition quality

D API specific gravity

Answer: C

Question 150

Critical pressure for steam is

- A 252 bar
- B 225 bar
- C 184 bar
- D 163 bar

**Answer: B**

**Question 151**

**Maximum steam pressure (in bar) in a locomotive boiler is limited to**

- A 5
- B 10
- C 18
- D 25

**Answer: C**

**Question 152**

**Compounding of steam turbine is done to**

- A Balance the rotor
- B Reduce the blade friction
- C Reduce the rotor speed
- D Connect the shaft of one turbine to that of another

**Answer: C**

**Question 153**

**In diesel engine, the suction contains**

- A Air only
- B Fuel only
- C Mixture of air and fuel
- D Air or fuel

**Answer: A**

**Question 154**

**The fluid drawn in during suction in petrol engine contains**

- A Fuel only
- B Fuel or air
- C Air only



D Mixture of air and fuel

Answer: D

Question 155

Spark ignition engine is

A Petrol engine

B Diesel engine

C Steam engine

D C.I. engine

Answer: A

Question 156

The working fluid for a diesel engine during the suction stroke is

A Fuel-air mixture

B Fresh air

C Products of combustion

D None of the above

Answer: B

Question 157

For a convergent nozzle, If the exit pressure is less than critical pressure, the mass rate of flow will be

A Increasing

B Decreasing

C Zero

D Constant

Answer: D

Question 158

In Impulse turbine, pressure on the two sides of the moving blades

A Increases

B Decreases

C Remain same

D May decrease or remain constant

Answer: C

Question 159

Brayton cycle is a reversed

- A Carnot cycle
- B Rankine cycle
- C Joule cycle
- D Dual cycle

**Answer: C**

**Question 160**

**For the same maximum pressure and peak temperature, which cycle will be most efficient?**

- A Diesel
- B Dual combustion
- C Otto
- D None of the above

**Answer: A**

**Question 161**

**An ideal fluid**

- A Has no viscosity
- B Satisfies the relation  $pv = RT$
- C Obeys Newton's Law of viscosity
- D is both incompressible and non-viscous

**Answer: D**

**Question 162**

**For small discharge at high pressure following pump is preferred:**

- A Mixed flow
- B Reciprocating
- C Axial flow
- D Centrifugal

**Answer: B**

**Question 163**

**In a reaction Turbine**

- A Flow can be regulated without loss
- B Water may be allowed to enter a part or whole of wheel circumference
- C The outlet must be above the tail race

D There is only partial conversion of available head to velocity head before entry to runner

**Answer: D**

**Question 164**

**Impulse Turbine is generally fitted**

A Little above the tail race

B At the level of the tail race

C Slightly below the tail race

D About 2.5 meters below the tail race

**Answer: A**

**Question 165**

**In general, the vanes of a centrifugal pump are**

A Curved forward

B Curved backward

C Radial

D Twisted

**Answer: B**

**Question 166**

**Francis Turbine is best suited for**

A All type of heads

B Medium head application from 24 to 180 m

C Low head installations up to 30 m

D High head installations above 180 m

**Answer: B**

**Question 167**

**Head developed by a centrifugal pump depends on**

A Impeller diameter

B Speed

C Type of casing

D (A) & (B)

**Answer: D**

**Question 168**

**The vertical distance of the center of pressure below the c.g. of the inclined plane area (submerged in liquid) is**

A  $\frac{I_{c.g.} \sin^2 \theta}{AX}$

B  $\frac{I_{c.g.} \cos^2 \theta}{AX}$

C  $\frac{I_{c.g.} \sin^2 \theta}{X}$

D  $\frac{I_{c.g.} \cos^2 \theta}{X}$

Answer: A

**Question 169**

For a nozzle to convert subsonic flow into a supersonic flow, it must be

- A Convergent type
- B Divergent type
- C Convergent-Divergent type
- D Of uniform cross-sectional area

Answer: C

**Question 170**

liquid moving with constant angular momentum has tangential velocity of  $1.2 \frac{m}{s}$  at 3 m from axis of rotation. The tangential velocity at 1.5m from axis of rotation, in  $\frac{m}{s}$  is

- A 0.6
- B 3.75
- C 5.4
- D 6.0

Answer: A

**Question 171**

With the same cross-sectional area and placed in the turbulent flow, the largest drag will be experienced by

- A A sphere
- B A streamlined body
- C A circular disc held normal to the flow direction
- D A circular disc held parallel to the flow direction

Answer: C

**Question 172**

A streamlined body is such that

- A It produces no drag for flow around it

- B It is symmetrical about the axis along the free stream
- C Separation of flow is avoided along its surface
- D The shape of the body coincides with the stream surface

Answer: D

**Question 173**

**Pascal second is the unit of**

- A Pressure
- B Kinematic viscosity
- C Dynamic viscosity
- D Surface tension

Answer: C

**Question 174**

**The shear stress in a turbulent pipe flow**

- A Varies parabolically with radius
- B is constant over the pipe radius
- C Varies according to the  $\frac{1}{7}$ th power law
- D Is zero at the center and increases linearly to the wall

Answer: D

**Question 175**

**A rectangular tank of square cross-section ( $2\text{m} \times 2\text{m}$ ) and height 4 m is completely filled up with a liquid. The ratio of total hydrostatic force on any vertical wall to its bottom is**

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

Answer: C

**Question 176**

**Air vessel is used in a reciprocating pump to obtain**

- A Reduction of suction head
- B Rise in delivery head
- C Continuous supply of water at uniform rate
- D Increases in supply of water

Answer: C

Question 177

Shear stress in a turbulent flow is due to

- A Viscous property of the fluid
- B Fluid density
- C Fluctuation of velocity in the direction of flow
- D Fluctuation of velocity in the direction of flow as well as transverse to it

Answer: D

Question 178

The discharge through a single acting reciprocating pump is (N-rpm)

- A  $Q = ALN$
- B  $Q = \frac{ALN}{60}$
- C  $Q = \frac{2ALN}{60}$
- D  $Q = 2ALN$

Answer: B

Question 179

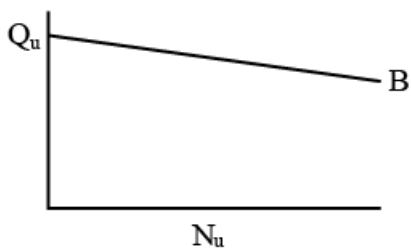
For viscous flow between two parallel plates, the pressure drop per unit length is equal to

- A  $12 \frac{\mu UL}{egD^2}$
- B  $12 \frac{\mu U}{D^2}$
- C  $12 \frac{\mu UL}{D^2}$
- D  $32 \frac{\mu UL}{D^2}$

Answer: D

Question 180

The unit discharge  $Q_u$  and unit speed  $N_u$  curve for a turbine is shown in figure, curve B is for



- A Francis turbine
- B Kaplan turbine

- C Pelton turbine
- D Propeller turbine

**Answer: A**

**Question 181**

**Permeability is poor for**

- A Fine grains
- B Medium grains
- C Coarse grains
- D Rounded grains

**Answer: A**

**Question 182**

**Dies for wire drawing are made of**

- A Cast steel
- B Cast Iron
- C Carbides
- D Wrought Iron

**Answer: C**

**Question 183**

**In thermit welding, aluminium and Ironoxide are mixed in the proportion of**

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

**Answer: A**

**Question 184**

**Metal patterns are used for**

- A Small castings
- B Large castings
- C Precise and intricate castings
- D Large scale production of castings

**Answer: D**

**Question 185**

In order to get the uniform thickness of the plate by rolling process, one provides

- A Camber on the rolls
- B Offset on the rolls
- C Hardening of the rolls
- D Antifriction bearing

**Answer: A**

**Question 186**

The most important requisite of a cutting tool material is

- A Carbon percentage
- B Percentage of alloying element
- C Red (hot) hardness
- D Easy Fabrication

**Answer: C**

**Question 187**

The Soldering process is carried out in the temperature range

- A 15 – 60°
- B 70 – 150°
- C 180 – 250°
- D 300 – 500°

**Answer: C**

**Question 188**

In electrical resistance welding, both heat and pressure are used to effect coalescence. The pressure necessary to effect the weld varies from

- A 50-100 kgf/cm<sup>2</sup>
- B 100-200 kgf/cm<sup>2</sup>
- C 250-500 kgf/cm<sup>2</sup>
- D 500-850 kgf/cm<sup>2</sup>

**Answer: C**

**Question 189**

The angle between the face and the flank of the single point cutting tool is known as

- A Rake angle



- B Clearance angle
- C Lip angle
- D Side angle

**Answer: A**

**Question 190**

**The commonly used flux for Brazing is**

- A Slag
- B Borax
- C Lead
- D Calcium chloride

**Answer: B**

**Question 191**

**Blanking and piercing operations can be performed simultaneously in**

- A Simple die
- B Compound die
- C Progressive die
- D Combination die

**Answer: C**

**Question 192**

**If electrical current is passed through the metals to be joined and heated to the plastic state and weld is completed by the application of pressure, the welding is known as**

- A Forge weld
- B Electric arc welding
- C Resistance welding
- D Thermit welding with pressure

**Answer: C**

**Question 193**

**In case of shaper, for finish machining, the practice is to use**

- A Maximum feeds at high speeds
- B Maximum feeds at slow speeds
- C Minimum feeds at slow speeds
- D Minimum feeds at high speeds

Answer: D

**Question 194**

In which milling operation, is the surface finish better?

- A Climb
- B Down
- C Conventional
- D Face

Answer: A

**Question 195**

Tool signature comprises of how many elements?

- A 5
- B 7
- C 9
- D 11

Answer: B

**Question 196**

A half nut is

- A nut manufactured in parts
- B Nut with half the standard pitch
- C A double start nut for a quick shaft
- D Mechanism that locks the lathe carriage to the lead screw for thread cutting

Answer: D

**Question 197**

Automobile gears are generally manufactured by

- A Hobbing
- B Stamping
- C Extrusion
- D Rolling

Answer: A

**Question 198**

Spot welding is most suitable for joining parts having thickness up to

- A 50 mm
- B 30 mm
- C 20 mm
- D 10 mm

**Answer: D**

**Question 199**

**Thermit welding differs from other methods of welding in that**

- A It does not use heat
- B It is less time consuming
- C It does not require electrodes
- D It employs exothermic chemical reaction for developing high temperature

**Answer: D**

**Question 200**

**The binder in case of synthetic sand used for moulding is**

- A Clay
- B Molasses
- C Water
- D Bentonite and water

**Answer: D**