



SSC JE

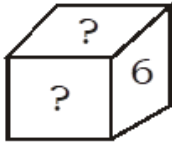
Mechanical Engineering

Mega Mock Test - 1

(June 27th - June 28th 2022)

Questions &
Answer Key

6. In the given dice which numbers will come in place of Questions marks.



- A. 1 and 4
- B. 3 and 4
- C. 2 and 3
- D. 5 and 2

Ans. C

7. Common **Directions:** In each of the following questions, select the one which is different, from other three responses. End

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

- A. Detach
- B. Affix
- C. Append
- D. Fasten

Ans. A

8. In 36 minutes, the minute hand gains over the hour hand by _____?

- A. 110°
- B. 185°
- C. 198°
- D. 175°

Ans. C

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

Question figure:



Answer figures:



- A. A
- B. B
- C. C
- D. D

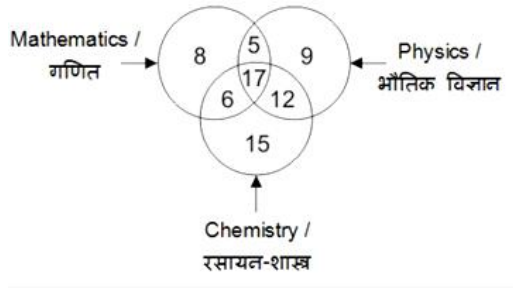
Ans. B

10. Choose the word which cannot be formed from the letters of the given word 'CHRISTMAS'

- A. CHRIST
- B. SMART
- C. CRUST
- D. HARM

Ans. C

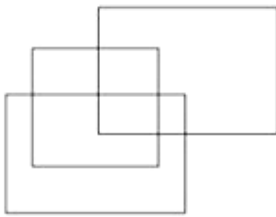
11. In the given figure, how many people study only 2 subjects?



- A. 11
- B. 23
- C. 12
- D. 40

Ans. B

12. How many rectangles or squares are there in the given figure?



- A. 9
- B. 10
- C. 11
- D. 12

Ans. C

13. From a same point K, Indu and Saumya walked in opposite directions. After walking 5km, Indu turned right and walked 3km, again she turned right and walked 5km. From the starting point Saumya walked 4km and turned left.

At this point, if Indu was facing East, then which direction would be Saumya facing?

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

Ans. A

14. Select the set of letters that when sequentially placed in the blanks of the given letter series will complete the series.

ST __ S _ OPS __ P

- A. STPOS
- B. POTTO
- C. TOTPO
- D. OPTTO

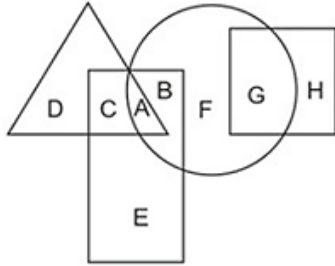
Ans. D

15. Which one of the following diagrams represents Insects, Flies and Dogs?



Ans. B

16. In the following figure, square represents Therapists, triangle represents Geneticists, circle represents yoga practitioners and rectangle represents Fathers. Which set of letters represents yoga practitioners who are neither genetics nor fathers?



- A. C, B
 B. E, A
 C. G, C
 D. F, G

Ans. D

17. Correct the following equation by interchanging the two signs and two numbers.

$$7 \times 6 + 5 - 4 = 33$$

- A. -, x and 4, 5
 B. x, + and 4, 5
 C. +, - and 5, 6
 D. x, - and 5, 6

Ans. C

18. A word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as shown in the given two matrix. The columns and rows of Matrix-I are numbered from 0 to 4 and that of Matrix-II are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column, for example, 'R' can be represented by 02, 20 etc. And 'U' can be represented by 56, 65 etc. Similarly, you have to identify the set for the word 'ROUGH'.

Matrix-I
आव्यूह - I

| | | | | | |
|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 |
| 0 | A | Q | R | V | W |
| 1 | S | R | K | G | O |
| 2 | R | E | J | O | Y |
| 3 | F | T | O | E | L |
| 4 | G | O | L | D | F |

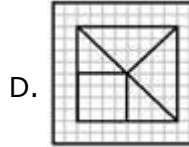
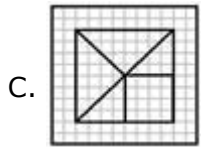
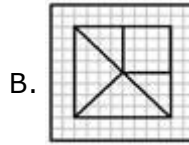
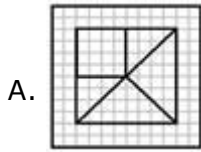
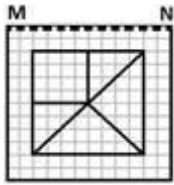
Matrix-II
आव्यूह - II

| | | | | | |
|---|---|---|---|---|---|
| | 5 | 6 | 7 | 8 | 9 |
| 5 | D | U | L | G | H |
| 6 | U | K | G | R | S |
| 7 | T | G | E | P | H |
| 8 | G | A | A | H | I |
| 9 | V | S | H | O | K |

- A. 02, 23, 65, 31, 99
 B. 02, 23, 56, 13, 78
 C. 02, 33, 56, 13, 97
 D. 02, 23, 56, 13, 97

Ans. D

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



Ans. D

20. **Select the missing number from the given responses**

| | | |
|-----|-----|-----|
| 111 | 314 | 205 |
| 34 | 39 | 102 |
| ? | 275 | 103 |

A. 172

B. 75

C. 77

D. 170

Ans. C

21. **Find the missing number in the series.**

2, 3, 8, ?, 112, 565

A. 565

B. 112

C. 27

D. 8

Ans. C

22. A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.

BEAG, DGCI, FIEK, ?

A. HGKJ

B. HKLJ

C. HKGM

D. HMIE

Ans. C

23. A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.

31, 32, 36, 45, 61, ?

A. 86

B. 89

C. 84

D. 83

Ans. A

24. **Select the number group in the options which is similar to the given number-group.**

(52, 49, 169)

- A. (41, 25, 49)
- B. (18, 52, 169)
- C. (59, 80, 98)
- D. (43, 49, 225)

Ans. A

25. Samira is taller than Sanjay, but shorter than Sushil. Sunil is as tall as Samira, but shorter than Sandeep, who is not as tall as Sushil. Who is the tallest?

- A. Sanjay
- B. Sushil
- C. Sandeep
- D. Samira

Ans. B

26. The practice of selling goods in a foreign country at a price below their domestic selling price is called

- A. Diplomacy
- B. Discrimination
- C. Dumping
- D. Double pricing

Ans. C

27. Medium term loans are provided for a period of _____

- A. 1 year to 2 years
- B. 15 months to 3 years
- C. 15 months to 4 years
- D. 1 year to 3 years

Ans. D

28. When two goods are perfect complementary, the indifference curve is

- A. A straight line
- B. U-shaped
- C. L-shaped
- D. circular in shape

Ans. C

29. Finance commission is organised

- A. Every year
- B. After every four year
- C. After every two year
- D. After every five year

Ans. D

30. Economic rent refers to:

- A. Payment made for the use of labour
- B. Payment made for the use of capital
- C. Payment made for the use of organisation
- D. Payment made for the use of land

Ans. D

31. The uppermost layer over the earth is called the _____.

- A. Mantle
- B. Core
- C. Crust
- D. Exosphere

Ans. C

32. In which year, the Keoladeo National Park was declared as a World Heritage Site?

- A. 1985
- B. 1980
- C. 1990
- D. 1928

Ans. A

33. How does La-Nina affect the Pacific Ocean?

- A. Decreases salinity of ocean
- B. Cools down the temperature of water
- C. Maintains stable temperature of water
- D. Increases salinity of ocean

Ans. B

34. The Battle of Wagram was between which of the following countries?

- A. France-America
- B. Russia- America
- C. France- Austria
- D. None of the above

Ans. C

35. Match the following.

| Social Reform Movement | Founder |
|-------------------------------|----------------|
|-------------------------------|----------------|

- | | |
|-----------------|---|
| 1. Arya Samaj | a. Raja Ram Mohan Roy |
| 2. Brahma Samaj | b. Dayanand Saraswati |
| 3. Veda Samaj | c. Atmaram Pandurang |
| 4. PrathnaSamaj | d. Keshab Chandra Sen and K. Sridharalu |

- A. 1-b, 2 -a, 3-c , 4-d
- B. 1-b , 2-a , 3-d , 4-c
- C. 1-a , 2-b , 3-d , 4-c
- D. 1-b , 2-d , 3-a , 4-c

Ans. B

36. The name of 'New Delhi' was given in which of the following year?

- A. 1930
- B. 1947
- C. 1927
- D. 1998

Ans. C

37. Who abolished the dual system of administration ?

- A. Lord Wellesley
- B. Warren Hastings
- C. Lord Cornwallis
- D. Sir John Shore
- E. None of the above/More than one of the above

Ans. B

38. What was the real name of Nurjahan ?

- A. Harkhabai
- B. Jagat Gosai
- C. Mariam-uz-Zamani
- D. Mehr-un-Nisaa

Ans. D

39. Hampi is also known by which name ?

- A. Karnataka
- B. Kishkindha
- C. Surat
- D. Both (A) and (B)

Ans. B

40. What is Kitchen cabinet?

- A. Council of ministers including President
- B. Small body of important ministers, prime minister and some important outsiders
- C. Legislative council of a state and heads of Panchayats
- D. Ministers from the legislative assemblies of state and union council of ministers including prime minister.

Ans. B

41. What is the capital of Kenya?

- A. Niamey
- B. Bamako
- C. Nairobi
- D. Tripoli

Ans. C

42. Which act gave India, the monopoly to print its own currency?

- A. Paper Currency Act of 1861
- B. Reserve Bank of India Act, 1934
- C. Banking Regulation Act, 1949
- D. Indian Coinage Act, 2011

Ans. A

43. Which of the following state is known as the "Tea Garden"?

- A. Sikkim
- B. Mizoram
- C. West Bengal
- D. Assam

Ans. D

44. India's first university for the transgender community will be opened in which state of India?

- A. Uttar Pradesh
- B. Madhya Pradesh
- C. Kerala
- D. Goa

Ans. A

45. Which of the following statements is not correct:

- A. The Average fixed cost curve is never U Shaped.
- B. The firm will attain equilibrium at the point where marginal cost curve cuts marginal revenue from below.
- C. The firm will attain normal profit when Average revenue is equal to marginal cost.
- D. The firm is used to its full capacity without any wastage of resources when marginal cost is equal to average cost.

Ans. C

46. As a quality measurement parameter cetane number is mainly used for measuring the quality of

- A. Kerosene
- B. Petrol
- C. Diesel
- D. Terpene

Ans. C

47. Match list (I) with list (II)

| I | II |
|-------------|---------------------------------|
| a. SARAS | i) battle tank |
| b. BHISHMA | ii) multipurpose civil aircraft |
| c. BRAHMOS | iii) satellite |
| d. INSAT-3C | iv) missile |

- A. a-i, b-ii, c-iii, d-iv
- B. a-iii, b-ii, c-iv, d-i
- C. a-iv, b-iii, c-i, d-ii
- D. a-ii, b-I, c-iv, d-iii

Ans. D

48. Third edition of bilateral maritime exercise 'Samudra Shakti 2021' was conducted between India and which country?

- A. Singapore
- B. Malaysia
- C. Indonesia
- D. Vietnam
- E. Australia

Ans. C

49. Which bank has signed MoU with National Small Industries Corporation (NSIC) for providing credit support to the micro, small and medium enterprise (MSME) sector?

- A. ICICI Bank
- B. HDFC Bank
- C. Axis Bank
- D. Yes Bank
- E. IndusInd Bank

Ans. B

50. Who has been appointed as the first Chief Information Officer of the US Army, after the Pentagon created the position in July 2020?

- A. Neera Tonden
- B. Rohini Kosoglu
- C. Ali Zaidi
- D. Raj Iyer
- E. Vivek Murthy

Ans. D

51. If 'm' is the jet ratio, then the number of buckets on the periphery of a pelton wheel is given by:

- A. $5 + \frac{m}{2}$
- B. $10 + \frac{m}{2}$
- C. $15 + \frac{m}{2}$
- D. $20 + \frac{m}{2}$

Ans. C

52. A simply supported beam of length L is subjected to a moment M at a distance of L/4 from the right end. The ratio of maximum & minimum bending moment in the beam is

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

Ans. C

53. Which of the following is water tube boiler?

- A. Lancashire boiler
- B. Scottish marine boiler
- C. Cornish boiler
- D. Benson boiler

Ans. D

54. Light impurities in centrifugal castings are

- A. collected at outer surface
- B. collected at inner surface
- C. mixed uniformly throughout the casting
- D. thrown away as slug

Ans. B

55. In an axial flow compressor stage, air enters and leaves the stage axially. If the whirl component of the air leaving the rotor is half the mean peripheral velocity of the rotor blades, then the degree of reaction will be

- A. 1.00
- B. 0.75
- C. 0.50
- D. 0.25

Ans. B

56. When the relationship between Reynolds number and the friction factor is represented by a straight line, the flow is said to be

- A. isentropic
- B. laminar
- C. turbulent
- D. vortex

Ans. B

57. Engine oil of viscosity 1.25×10^{-3} (m²/s) is flowing through a pipe of radius 1 m. The average velocity of oil through the pipe is 1.2 m/sec. If the velocity profile is parabolic profile then maximum velocity of oil is _____.

- A. 2.4m/sec
- B. 1.8m/sec
- C. 1.5m/sec
- D. 3.6m/sec

Ans. A

58. Consider the following :

- 1) Injector
- 2) Economizer
- 3) Blow-off cock
- 4) Steam stop valve

Which of the above is/are not boiler mounting?

- A. Only 1
- B. Only 1 and 2
- C. 1, 2 and 3
- D. 2 and 4

Ans. B

59. Which of the following properties are NOT sufficient to determine the properties of a vapour?

- 1) Temperature
- 2) Pressure
- 3) Dryness fraction

4) Specific volume

A. 1 and 2

B. 2 and 3

C. 3 and 4

D. 1 and 4

Ans. A

60. The standard value of the belt angle for V-belts is:

A. 15°

B. 30°

C. 40°

D. 60°

Ans. C

61. The efficiency of ideal regenerative Brayton cycle is

Where, $T_1 \rightarrow$ Inlet compressor temperature

$T_2 \rightarrow$ Outlet compressor temperature

$T_3 \rightarrow$ Inlet Turbine temperature

$r_p \rightarrow$ pressure ratio

A. $\eta = 1 - \frac{T_3}{T_1} (r_p)^{\frac{\gamma-1}{\gamma}}$

B. $\eta = 1 - \frac{T_1}{T_3} (r_p)^{\frac{\gamma-1}{\gamma}}$

C. $\eta = 1 - \frac{T_1}{T_3 (r_p)^{\frac{\gamma-1}{\gamma}}}$

D. $\eta = 1 - \frac{T_1}{T_2} (r_p)^{\frac{\gamma-1}{\gamma}}$

Ans. B

62. A disc is rigidly fixed to rotating shaft at an angle of θ . The shaft rotates at an angular speed of ω . Let I_p and I_d denote the moments of inertia about the polar and diametral axis. The gyroscopic torque on the disc is:

A. $\frac{1}{2} I_p \omega^2 \sin 2\theta$

B. $\frac{1}{2} (I_p - I_d) \omega^2 \sin 2\theta$

C. $\frac{1}{2} I_D \omega^2 \sin 2\theta$

D. $\frac{1}{2} (I_p - I_d) \omega^2 \cos 2\theta$

Ans. B

63. In the region of boundary layer on a flat plate surface where velocity is not zero, the viscous force is

A. less than inertial force

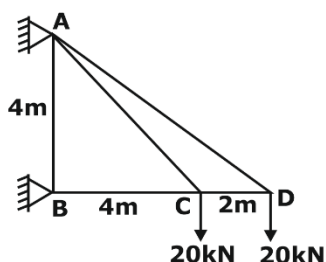
B. more than inertial force

C. equal in magnitude

D. not predictable

Ans. B

64. The axial force in the member BC is



- A. 0 kN
- B. 50 kN
- C. 30 kN
- D. -50 kN

Ans. D

65. Steel can be hardened quickly by _____ process
- A. carburizing
 - B. cyaniding
 - C. induction hardening
 - D. None & these

Ans. C

66. The average frequency of sparks in electro discharge machining is
- A. 500 sparks/s
 - B. 1000 sparks/s
 - C. 5000 Sparks/s
 - D. 10000 sparks/s

Ans. D

67. If the surface tension of water-air interface is 0.073 N/m, the gauge pressure inside a rain drop of 1 mm diameter will be
- A. 0.146 N/m²
 - B. 73 N/m²
 - C. 146 N/m²
 - D. 292 N/m²

Ans. A

68. Which of the following is the reason for irreversibility due to friction _____?
- A. Internal irreversibility
 - B. External irreversibility
 - C. Frictional irreversibility
 - D. Chemical irreversibility

Ans. A

69. The instantaneous centres which vary with the configuration of the mechanism is known as
- A. Fixed instantaneous centres
 - B. permanent instantaneous centres
 - C. neither fixed nor permanent instantaneous centres
 - D. None of the above

Ans. C

70. In compression ignition engines the knocking tendency increases with
- A. Increase of compression ratio
 - B. Decrease of compression ratio
 - C. Increase of coolant water temperature
 - D. Increase of temperature of inlet air

Ans. B

71. Which one of the following elements is an austenite stabilizer _____?
- A. Chromium
 - B. Tungsten
 - C. Nickel
 - D. Molybdenum

Ans. C

72. Consider the following discharge measurement devices :
1. Cylindrical mouthpiece flowing full
 2. Sharp-edged orifice

- 3. Convergent-divergent mouthpiece
- 4. Borda's re-entrant mouthpiece flowing free

The correct sequence of increasing order of their discharge coefficient is

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

Ans. A

73. For pumping viscous oil, which of the flowing pumps will be used?

- A. Centrifugal pump
- B. Reciprocating pump
- C. Turbine pump
- D. Screw pump

Ans. D

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

- A. directly to radius
- B. inversely to radius
- C. directly to the square of radius
- D. inversely to the square of radius

Ans. A

75. The discharge over a rectangular notch is

- A. inversely proportional to $H^{3/2}$
- B. directly proportional to $H^{3/2}$
- C. inversely proportional to $H^{5/2}$
- D. directly proportional to $H^{5/2}$

Ans. B

76. An real gas as compared to ideal gas at very high pressure occupies

- A. more volume
- B. less volume
- C. same volume
- D. unpredictable behaviour

Ans. A

77. Which one of the following is responsible for the operation of a thermostatic expansion value?

- A. Pressure change in evaporator
- B. Temperature changes in evaporator
- C. Degree of superheat in evaporator
- D. Degree of subcooling in evaporator

Ans. C

78. Which one of the following is an example of the 50% reaction machine?

- A. Pelton wheel
- B. Parson turbine
- C. Modern gas turbine
- D. Lawn sprinkles

Ans. B

79. Match the following lists and choose the correct answer using the codes given below

| List-I (Turbines) | List-II |
|-------------------|--|
| P. Propeller | 1. Inward flow reaction turbine |
| Q. Francis | 2. Tangential flow impulse turbine |
| R. Kaplan | 3. Axial flow reaction turbine with fixed vanes |
| S. Pelton wheel | 4. Axial flow reaction turbine with adjustable vanes |

A. P – 2 Q – 4 R – 1 S – 3

B. P – 3 Q – 4 R – 1 S – 2

C. P – 2 Q – 1 R – 4 S – 3

D. P – 3 Q – 1 R – 4 S – 2

Ans. D

80. Guest's theory of failure is applicable for following of materials,

A. brittle

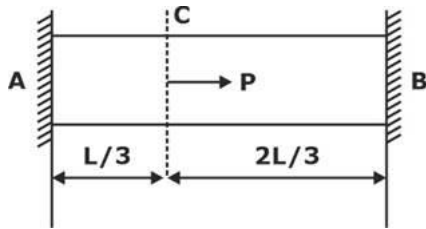
B. ductile

C. elastic

D. plastic

Ans. B

81. A prismatic bar is supported between rigid supports as shown in figure. The support reactions will be



A. $R_A = \frac{P}{3}$ and $R_B = \frac{2P}{3}$

B. $R_A = \frac{2P}{3}$ and $R_B = \frac{P}{3}$

C. $R_A = P$ and $R_B = 0$

D. $R_A = \frac{P}{2}$ and $R_B = \frac{P}{2}$

Ans. B

82. Thermostat is used in radiators to _____.

A. control the velocity of water

B. control distribution of water to various cylinders

C. control the water temperature

D. control the pressure of water

Ans. C

83. A cup of diameter 16 mm and height 9 mm to be drawn. Neglecting sheet thickness, diameter of blank is_____.

A. 32.40 mm

B. 26.84 mm

C. 28.84 mm

D. 30.24 mm

Ans. C

84. Which one of the following thermo-dynamics processes approximate the steaming of food in a pressure cooker?

A. Isenthalpic

B. Isobaric

C. Isochoric

D. Isothermal

Ans. C

85. What is the use of surge tank in hydraulic machines _____?
- A. To store condensate
 - B. To prevent surging
 - C. To provide better regulation of water flow in the system.
 - D. To prevent chocking

Ans. C

86. If the polar moment of inertia is increased to four times, then what will be the effect on free torsional vibrations of a single motor system?
- A. Increases 4 times
 - B. Increases 2 times
 - C. Decreases 4 times
 - D. Decreases 2 times

Ans. B

87. Blowby losses are _____.
- A. directly proportional to the inlet pressure
 - B. inversely proportional to the inlet pressure
 - C. proportional to the square root of inlet pressure
 - D. none of the above

Ans. C

88. Most commonly used lubrication system in automobiles is the _____.
- A. splash system
 - B. pressure system
 - C. petrol system
 - D. gravity system

Ans. B

89. Which combination of the following statements is correct?
The incorporation of re-heater in a steam power plant
- A) Always increase the thermal efficiency of the plant
 - B) Always increases the dryness fraction of steam at condenser inlet
 - C) Always increases the main temperature of heat addition
 - D) Always increases the specific work output
- A. A and D only
 - B. B and D
 - C. A, C and D only
 - D. A, B, C and D

Ans. B

90. In an arc welding process, voltage & current are 20 V and 275 A . The arc heat transfer efficiency is 0.85 and welding speed is 17 mm/sec. The net heat input (in J/mm) is _____.
- A. 4675
 - B. 2550
 - C. 1270
 - D. 275

Ans. D

91. When moist air comes in contact with silica get, the
- A. Dry bulb temperature of air decreases
 - B. Relative humidity of air decreases

- C. Specific humidity of air increases
- D. Wet bulb temperature of air decreases.

Ans. B

92. Which thermodynamics law predicts correctly, the degree of completion of chemical reaction?

- A. Zeroth law
- B. First law
- C. Second law
- D. Third law

Ans. C

93. A 5 m long ladder of weight 'w' resting on a smooth vertical wall with its lower end at 4 m from the wall. The coefficient of friction between the floor & ladder at equilibrium is:

- A. 4/5
- B. 3/5
- C. 3/8
- D. 2/3

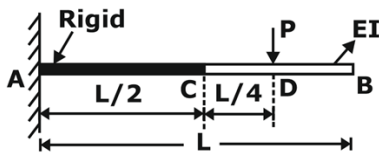
Ans. D

94. The thick cylinder is subjected to internal pressure 'P'. The maximum hoop stress occurs at

- A. inner wall
- B. midpoint of thickness
- C. outer layer
- D. None

Ans. A

95. A cantilever beam is rigid upto length L/2 and from L/2 to L, the beam has flexural rigidity EI. A point load P is loaded at L/4 distance from free end. Find the deflection at free end?



- A. $\frac{5PL^3}{384EI}$
- B. $\frac{PL^3}{384EI}$
- C. $\frac{PL^3}{192EI}$
- D. $\frac{PL^3}{128EI}$

Ans. A

96. A journal bearing is a _____ contact bearing working on the hydrodynamic lubrication and which supports load in _____ direction.

- A. Sliding, Axial
- B. Rolling, Radial
- C. Sliding, Radial
- D. Rolling, Axial

Ans. C

97. To avoid cavitation in centrifugal pumps _____.

- A. Suction pressure should be low
- B. Delivery pressure should be low
- C. Suction pressure should be high
- D. Delivery pressure should be high

Ans. A

98. Which of the following option is CORRECT for two degrees of freedom of the system?

- A. Vibrating absorber
- B. Vibrating engine
- C. Pure rolling of a cylinder
- D. A rigid body in space

Ans. C

99. For which columns Rankine's formula is valid

- A. Long Columns only
- B. Short Columns only
- C. Both long and short columns
- D. None.

Ans. C

100. On what basis is the coal classified?

- A. Period of formation
- B. Depending on capacity to burn
- C. Region/area where is it formed
- D. Physical and chemical composition

Ans. D
