Engineering Assistant

SET - B

07/9/19

PART - A

01. The mineral that is useful for formation of strong bones and teeth is
(a) Calcium (b) Iron
(c) Cobalt (d) Zinc

01. Ans: (a)

02. World Wide Web was discovered by
(a) Bill Gates
(b) Larry Page
(c) Ted Nelson
(d) Tim Berners-Lee

02. Ans: (d)

Sol: World Wide Web or WWW is an information system where documents and other web resources are identified by uniform resource locator's. Tim Berners-Lee discovered WWW.

03. The correct order of dynasties who ruled Vijayanagara Empire
A. Saluva Dynasty
B. Aravidu Dynasty
C. Sangama Dynasty
D. Tuluva Dynasty
(a) C, A, D, B (b) A, B, C, D
(c) C, D, A, B (d) D, C, B, A

03. Ans: (a)

04. Mokshagundam Visvesvaraya was responsible for the construction of a dam across the river Cauvery near Kannambadi village. This dam is known as
(a) Ramapada Sagar
(b) Nagarjuna Sagar
(c) Krishnaraja Sagar
(d) Indira Sagar

04. Ans: (c)

05. Match the following correctly with respect to Mahasabha and corresponding leaders:

A. Visalandhra Mahasabha	i. C. Rajagopalachari
B. Rayalaseema Mahasabha	ii. Durga bai Deshmukh
C. Andhra Mahila Sabha	iii. C.L.N. Reddy, K. Subrahmanyam and others
D. Dakshina Pradesh	iv. A. Kaleswara Rao

(a) A - i, B - ii, C - iii, D - iv
(b) A -iv, B - iii, C - ii, D - i
(c) A - ii, B - i, C - iv, D - iii
(d) A - iii, B - ii, C - i, D - iv

05. Ans: (b)

06. Out of the given Mandals identify the mandal from Telangana state that was not merged in Andhra Pradesh state after bifurcation of Andhra Pradesh in 2014.
(a) Kukkunuru (b) Kunavaram
(c) Velerupadu (d) Charla

06. Ans: (d)

07. Consider the following statements:
A. Warren Hastings fought the first Anglo-Maratha war and the Rohilla war.
B. Warren Hastings encouraged Rohilla Afghans
C. Warren Hastings was appointed as Governor of Bengal in 1772 C.E.
Identify the correct statements from the above.
(a) Both A and C
(b) Only B
(c) Both A and B
(d) Both B and C

07. Ans: (a)

08. The words added in the Preamble of the Indian Constitution through the 42nd Constitutional (Amendment) Act, 1976 are
(a) Sovereign and Supreme
(b) Socialist and Secular
(c) Democratic and Republic
(d) Liberty and Justice

08. Ans: (b)

Sol: Preamble is the summary of Indian constitution.
42nd CAA 1976 has added 3 words to preamble they are:
1. Socialist,
2. Secular ,
3. Integrity

09. The Election Commission in India is a
(a) Private body
(b) Subordinate body
(c) Constitutional body
(d) Foreign body

09. Ans: (c)

Sol:

- Election commission of India was constituted in 1950, as a constitutional Body
- Article 324 to 329 deals with ECI.

10. Directive Principles of State Policy are mentioned in the Indian Constitution in
(a) Part III from Articles 12 to 35
(b) Part I from Articles 1 to 4
(c) Part II from Articles 5 to 11
(d) Part IV from Articles 36 to 51

10. Ans:(d)

Sol: DPSP are discussed in past In article 36-51
They are borrowed from Irish constitution.
They discusses the philosophy of constitution.

11. Voting age was reduced from 21 to 18 years through this Constitution Amendment Act in India.
(a) 61st (b) 62nd (c) 63rd (d) 64th

11. Ans: (a)

Sol: 61st CAA 1989 was passed by Indian parliament which decreases the age of working from 21 years to 18 yrs.

12. The following Authority is not concerned with the Indian Parliament:
(a) Chief Minister
(b) The President of India
(c) Prime Minister
(d) Union Cabinet Ministers

12. Ans: (a)

Sol: Article 79 of constitution defines the parliament as
1. Lok sabha
2. Rajya Sabha
3. President of India

13. The person who described Human Rights as the new standards of civilization:
(a) John Dowski (b) Plato
(c) Aristotle (d) Rousseau

13. Ans: (*)

Sol: J. Donnelly

14. Consider the following statements related to the National Human Rights Commission, India :
A. It is headed by the Prime Minister of India.
B. There will be a General Secretary having the status of Secretary General in the Commission.
C. The Chairman and members shall hold this office for ten years or until the age of 80 years.
Identify the correct statements from the above.
(a) Only A (b) Only C
(c) Only B (d) Both A and C

14. Ans: (c)

Sol: The head of NHRC is chairperson appointed by president of India who stays in the office for 5 yrs (or) 70 yrs of age.
It is a non constitutional body established by a act of parliament in 1993.

15. Compulsory Military service of individuals, the interference of government in private life of individuals are some negative repercussions of this concept.
(a) Practical Justice (b) Social Justice
(c) Ecological Justice (d) Historical Justice

15. Ans: (b)

Sol: Social justice is a fundamental rights guaranteed by constitution to the people of India.
They are discussed in preamble, fundamental rights, DPSP of constitution.

16. The term 'Society' is derived from this Latin word.
(a) Socius (b) Sociali
(c) Soco (d) Soiko

16. Ans: (a)

17. T.H. Green considered it as the most important fundamental right.
(a) Moral Right (b) Economic Right
(c) Political Right (d) Right to Life

17. Ans: (d)

18. An important world famous volcanic explosion occurred in Indian territory at
(a) Narcondam
(b) Semeru
(c) Darjeeling
(d) Kedarnath

18. Ans: (a)

19. These rocks were used in the construction of Red Fort and Agra Fort in India.
(a) Plutonic Rocks
(b) Igneous Rocks
(c) Sedimentory Rocks
(d) Metamorphic Rocks

19. Ans: (c)

20. Soil erosion in Indian is associated with
(a) Crop rotation
(b) Hydroponic cultivation
(c) Terrace cultivation
(d) Deforestation

20. Ans: (d)

21. The tributaries of Krishna river i n Andhra Pradesh are
(a) Koyna and Wardha
(b) Munnery and Paleru
(c) Jayamangala and Chitravathi
(d) Hagari and Vedavathi

21. Ans: (b)

22. Andhra Pradesh stands first in the country in the production of
(a) Barytes and Limestone
(b) Manganese and Coal
(c) Copper ore and Steel
(d) Aluminium and Coal

22. Ans: (a)

23. The ASHA program in the State of Andhra Pradesh is under
(a) Department of Health
(b) Department of Women and Child Welfare
(c) Government of Andhra Pradesh
(d) National Rural Health Mission

23. Ans: (d)

24. The policy framework of the Tribal Welfare Department has the following dimensions:
A. Constitutional
B. Developmental
C. Coordination
(a) Only A and B (b) Only B and C
(c) Only A and C (d) A, B and C

24. Ans: (d)

25. In 2019 - 20, the Andhra Pradesh Government has allocated social security and welfare, a budgeted expenditure of
(a) Rs. 978.58 crores
(b) Rs. 2,707.87 crores
(c) Rs. 14,143.00 crores
(d) Rs. 3,617.38 crores

25. Ans: (b)

26. A compact area of at least 300 population or about 60 - 70 households that are poorly formed and congested are called
(a) Poor households
(b) Rural settlements
(c) Slums
(d) Squatters

26. Ans: (c)

27.
A. Women affected by violence along with their children can avail temporary shelter for a maximum period of 5 days with the 'One Stop Centre' (OSC).
B. The states that opt for 'One Stop Centres' are required to set up permanent buildings.

State which of the above statements(s) is/are true.
(a) Only A
(b) Only B
(c) Both A and B
(d) Neither A nor B

27. Ans: (a)

28. Choose the word which is least like the other words in the group
(a) Church (b) Mosque
(c) Monastery (d) Temple

28. Ans: (c)

Sol: All except Monastery are places of worship, while monastery is a place where monks stay.

29. If TOUR is written in a certain code as 1234, CLEAR as 56784 and SPARE as 90847, what will be the 5th digit for SCULPTURE in the same code?
(a) 3 (b) 5
(c) 8 (d) 0

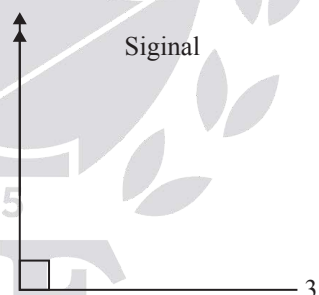
29. Ans: (d)

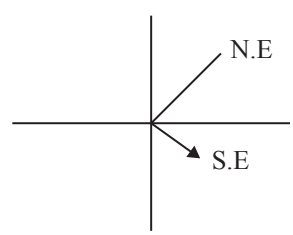
Sol: TOUR is coded as 1234
CLEAR is coded as 56784
SPARE is coded as 90847
From above code, in SCULPTURE 5th digit P is coded as 0.

30. A watch is showing 3'0 clock. If the minute hand points towards the North-East, then the hour hand will point towards the
(a) South
(b) South-West
(c) North-East
(d) South-East

30. Ans: (d)

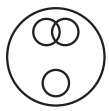
Sol:

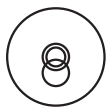


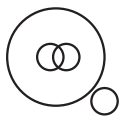


31. Here area a few different types of Venn diagrams. Which of the following diagrams correctly represents the given statement?

Statement: In a dinner party both fish and meat were served. Some took only fish and some only meat. There were some vegetarians who did not accept either. The rest accepted both fish and meat.

(a) 

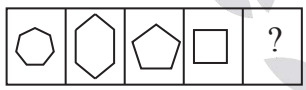
(b) 

(c) 

(d) 

31. Ans: (a)

32. Select the correct answer from the given options which would continue the series.



(a) 

(b) 

(c) 

(d) 

32. Ans: (b)

Sol: 1st figure -7 lines(Septagaon), 2nd figure - 6 lines (Hexagon)

3rd figure - 5 lines (Pentagon) , 4th figure - 4 lines (square)

5th figure - 3 lines (Triangle)

33. Three number are in the ratio 5 : 4 : 3 and their L.C.M. is 2400. Their H.C.F. is

(a) 40 (b) 80

(c) 120 (d) 20

33. Ans: (a)

Sol: Three numbers are in the ratio 5 : 4 : 3

Let the numbers be 5x , 4x, 3x

LCM (5x, 4x, 3x) = 60 x = 2400

so, x = 40

HCF(5x , 4x, 3x) = x = 40

34. The average age of students of a class is 15.8 years. The average age of boys in the class is 16.4 years and that of girls is 15.4 years. The ratio of the number of boys to the number of girls in the class is

(a) 1 : 2 (b) 2 : 3

(c) 3 : 4 (d) 3 : 5

34. Ans: (b)

Sol: Using mixtures & allegations,

Boys Average		GMS Average
16.4 years		15.4 years
	Students Average	
	15.8 years	
0.4	:	0.6
2	:	3

So, the ratio of the number of boys and girls is 2 : 3

35. Find the selling price of an article if a shopkeeper allows two successive discounts of 5 % each on the marked price of Rs. 80.

(a) Rs. 70.10 (b) Rs. 70.20

(c) Rs. 72.00 (d) Rs. 72.20

35. Ans: (b)

Sol:

$$MP \times 95\% \times 95\ \% = SP$$

$$80 \times \frac{95}{100} \times \frac{95}{100} = SP$$

$$SP = \frac{76 \times 95}{100} = 72.2\%$$

36. A man lends Rs. 10,000 in four parts. If he gets 8% on Rs. 2,000, $7\frac{1}{2}$% on Rs. 4,000 and $8\frac{1}{2}$% on Rs. 1,4000, what percent must he get for the remaining amount, if his average annual interest is 8.13%?
(a) 7% (b) 9%
(c) $9\frac{1}{4}$% (d) $10\frac{1}{2}$%

36. Ans:(b)

Sol:

10,000 (8.13%) = 2000 (8%) + 4000 (7.5%) + 1400 (8.5%) + 2600 (a%)

$\Rightarrow$ 100(813) = 20(800) + 40 (750) + 14 (850) + 2600 a

$$\Rightarrow a = \frac{(81,300 - 16000 - 30000 - 11900)}{2600} = 9\%$$

37. A hemisphere of radius 6 cm is cast into a right circular cone of height 75 cm. The radius of the base of the cone is
(a) 1.4 cm (b) 2 cm
(c) 2.4 cm (d) 4.2 cm

37. Ans: (c)

Sol: Volume hemisphere = Volume cane

$$\frac{2}{3}\pi r^3 = \frac{1}{3}\pi r_c^2 h$$

$$2(6^3) = r_c^2(75) \Rightarrow r_c^2 = \frac{2 \times 216}{75}$$

$\Rightarrow r_c = 12/5 = 2.4$ cm

38. This film was awarded Best Feature Film at the prestigious SAARC Film Festival, 2019.
(a) Kabir Singh
(b) Baahubali - 2
(c) Nagarkirtan
(d) Village Rockstars

38. Ans: (c)

Sol: NagaKirtan directed by Kawshik Ganguly was awarded best film in SAARC film festival.

39. The 22nd National Conference on e-Governance NCeG - 2019 was held on 8 - 9th August 2019 at Shillong, Meghalaya. The theme of this conference was
(a) Digital India : Success to Excellence
(b) Think Local : Better and Consistent
(c) Think Global : Be Extraordinary
(d) Digital India : A Celebration of Success

39. Ans: (a)

Sol: 22nd National conference an e-governance also called Shillong declaration was concluded in 8-9 August 2019.
The theme is "Digital India". Success to excellence.

40. Match the Countries with their corresponding rankings with respect to ICC Test team rankings which was released in August 2019.

Country	Rank
A. New Zealand	i. 1
B. India	ii. 2
C. South Africa	iii. 3

(a) A - i, B - ii, C - iii
(b) A - ii, B - iii, C - i
(c) A - iii, B - ii, C - i
(d) A - ii, B - i, C - iii

40. Ans: (d)

Sol: As on August 2019 the ICC Test team Ranking are
(a) India (b) New Zealand (c) South Africa
ODI - (a) England (b) India (c) New Zealand.
T20 - (a) Pakistan (b) England (c) South Africa

41. This State Assembly has recently passed the Education Regulatory and Monitoring Commission Bill, 2019 to regulate school fees.
(a) Rajasthan
(b) Tamil Nadu
(c) Andhra Pradesh
(d) Kerala

41. Ans: (c)

Sol: Andhra Pradesh has passed this bill to regulates school fees to reduce the burden on parents.

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Regular Batch	Daily 4 to 6 Hours	14th September	5 to 6 Months	Abids

42. Odisha State Government recently changed its Secretariat's name to
(a) Odisha Seva Bhavan
(b) Lok Seva Bhavan
(c) Praja Bhavan
(d) Praja Seva Bhavan

42. Ans: (b)

Sol: They have recently changed to Lok Seva Bhavan

43. Photographic films or plates have this as an essential ingredient.
(a) Silver oxide (b) Silver thiosulphate
(c) Silver bromide (d) Silver nitrate

43. Ans: (c)

44. Plant hormones that control fruit ripening are
(a) Auxins (b) Cytokinins
(c) Ethylene (d) Gibberellic acid

44. Ans: (c)

45. Green tomatos turn red on ripening. This is due to
(a) Formation of new chromoplasts
(b) Replacement of chlorophyll with new pigment lycopin in chloroplast
(c) Change of chromoplasts into chloroplasts
(d) It is a normal process

45. Ans: (b)

46. The session started exactly _____ 10 o'clock
Fill in the blank with the suitable preposition.
(a) on (b) in (c) at (d) for

46. Ans: (c)

47. I gifted my friend a beautiful watch.
Choose the suitable passive voice from of the above sentence.
(a) A beautiful watch was gifted to my friend by me.
(b) My friend gifted a beautiful watch to me.
(c) A beautiful watch gifted to my friend
(d) My friend was gifted by me

47. Ans: (a)

48. Choose the part labelled as A, B, C, D that has an error.
Jay didn't / told anybody / where he had got
(A) (B) (C)
/ all that money.
(D)
(a) A (b) B
(c) C (d) D

48. Ans: (b)

49. Choose the correct sequence lablled as P, Q, R, S to produce the correct sentence.
than / the human brain / a computer/ works faster
(P) (Q) (R) (S)
(a) Q P R S (b) S Q P R
(c) R S Q P (d) R S P Q

49. Ans: (d)

Sol: A computer works faster than the human brain.

50. Sahiti is more intelligent than any other student in the class.
Choose the positive degree for the above sentence.
(a) No other student is more intelligent that Sahiti
(b) No other student in the class is as intelligent as Sahiti.
(c) Sahiti is the most intelligent student in the class.
(d) Sahiti is an intelligent girl.

50. Ans: (b)

PART - B

51. The ratio of maximum to average shear stress in a solid circular section is
(a) 1.0 (b) 1.33
(c) 1.50 (d) 1.83

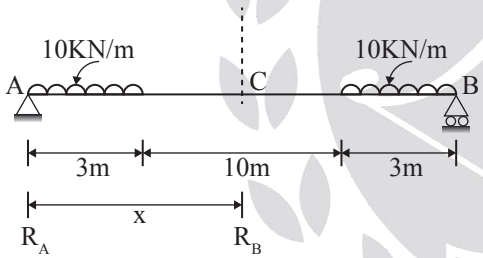
51. Ans: (b)

Sol: $\left(\frac{\tau_{max}}{\tau_{avg}}\right)_{circular} = \frac{4}{3} = 1.33$

52. A beam 10 m long is simply supported at the ends. It carries a UDL of 10 kN/m up to a distance of 3 m from either end. The shear force at the centre of the beam is
(a) 0 kN (b) 30 kN
(c) 10 kN (d) 50 kN

52. Ans: (a)

Sol:



Due to symmetry $R_A = R_B = \frac{\text{Total load}}{2}$

$= \frac{10 \times 3 + 10 \times 3}{2} = 30$ kN

SF @ C, @ x = 5m

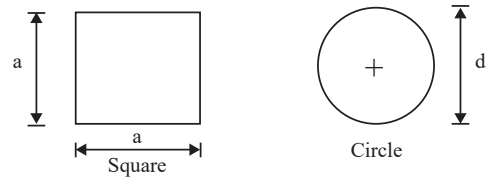
$F_c = + R_A - (10 \times 3)$

$= 30 - 30 = 0$ kN

53. A square beam and a circular beam have same length, same allowable stress and same bending moment. The ratio of weight of the square beam to circular beam is
(a) $\frac{1}{2}$ (b) 1
(c) $\frac{1}{1.12}$ (d) $\frac{1}{\sqrt{2}}$

53. Ans: (c)

Sol:



Since both have same length, same allowable bending stress and same maximum bending moment.

$(Z_{N.A})_{square} = (Z_{N.A})_{circle}$

$\frac{a^3}{6} = \frac{\pi}{32} d^3 \quad \Rightarrow a = \frac{1}{1.193} d$

$\therefore \frac{\text{Wt. of square beam}}{\text{Wt. of circular beam}} = \frac{A_{square}}{A_{circle}}$

$= \frac{a^2}{\frac{\pi}{4} d^2}$

$= \frac{4a^2}{\pi d^2} = \frac{4\left(\frac{d}{1.193}\right)^2}{\pi d^2} = \frac{1}{1.12}$

54. The resultant of a force system where $\Sigma V = 0$ is
(a) horizontal (b) vertical
(c) inclined (d) equal to zero

54. Ans: (b)

Sol: Resultant $= \sqrt{\Sigma H^2 + \Sigma V^2} \quad \because \Sigma V = 0$

$= \sqrt{\Sigma H^2} = \Sigma H$ i.e. Horizontal

55. Which of the following is a vector quantity?
(a) Energy (b) Mass
(c) Momentum (d) Angle

55. Ans: (c)

Sol: Momentum = Mass × velocity

↓ ↓

Scalar vector

Note: A scalar is multiplied by vector is a vector.

56. The moment of inertia of a circular section about an axis perpendicular to the section is
(a) $\frac{\pi d^3}{16}$ (b) $\frac{\pi d^3}{32}$
(c) $\frac{\pi d^4}{32}$ (d) $\frac{\pi d^4}{64}$

56. Ans: (c)

Sol: $I_{zz} = I_{xx} + I_{yy}$

$$= \frac{\pi}{64}d^4 + \frac{\pi}{64}d^4 = \frac{\pi}{32}d^4$$

57. The radius of gyration of circular area of 8 cm radius (in cm) is
(a) 8 (b) 4
(c) 2 (d) 16

57. Ans: (b)

Sol: $r = 8$ cm $\Rightarrow d = 16$ cm

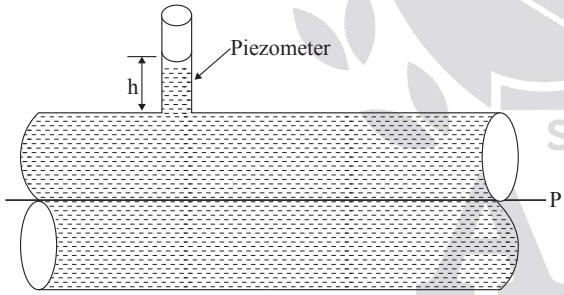
Radius of gyration $= k = \sqrt{\frac{I}{A}}$

$$= \sqrt{\frac{\frac{\pi}{64}d^4}{\frac{\pi}{4}d^2}} = \frac{d}{4} = \frac{16}{4} = 4 \text{ cm}$$

58. A piezometer tube is used only for measuring
(a) low pressure (b) high pressure
(c) moderate pressure (d) vacuum pressure

58. Ans: (a & c)

Sol: Piezometer tube is used only for low pressure (static) measurements and upto moderate pressure also.



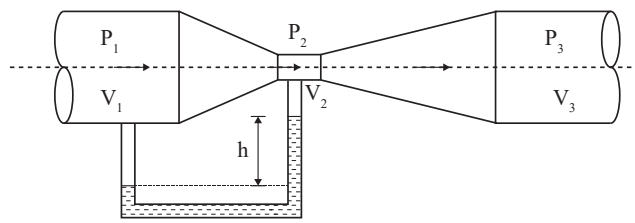
Piezometer cannot measure vacuum pressures and high pressures and not suitable for gaseous pressures measurements.

Note: Some web pages, answer (c) is mentioned. It can be challenged if key provided by APPSC other than (a & c) options.

59. The pressure of liquid flowing through the divergent portion of the venturimeter
(a) remains constant
(b) increases
(c) decreases
(d) depends upon mass of liquid

59. Ans: (b)

Sol:

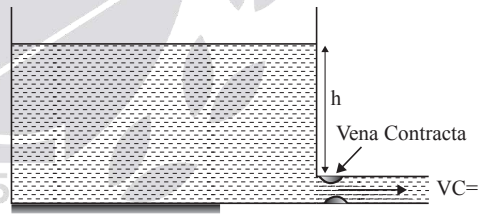


In Divergent portion of the venturimeter, the velocity decreases, as the c/s area increases (Discharge = AV = constant), subsequently pressure head increases (as per Bernoulli's equation)

60. The theoretical velocity of jet at vena contracta is
(a) $2gH$ (b) $h\sqrt{2g}$
(c) $2g\sqrt{H}$ (d) $\sqrt{2gH}$

60. Ans: (d)

Sol:



Theoretical velocity of jet at vena contracta = $\sqrt{2gH}$

Where H = head of liquid at Vena-contracta.

61. The velocity at which the flow changes from linear to turbulent flow is called
(a) critical velocity
(b) velocity of approach
(c) subsonic velocity
(d) supersonic velocity

61. Ans: (a)

Sol: The velocity at which the flow change from laminar flow to turbulent flow is called critical velocity.

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Exam Date : 15th Sept. 2019 | @ 10:00 AM

Mode of Exam : OFFLINE | Total Question : 30 | Total Marks : 50 | Duration : 90 Min

Last Date of Online Application: **11th September 2019**

FREE MOCK INTERVIEW

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62. The flow in a pipe, is neither laminar nor turbulent when Reynolds number is
(a) less than 2000
(b) between 2000 and 2800
(c) between 2800 and 4000
(d) more than 4000

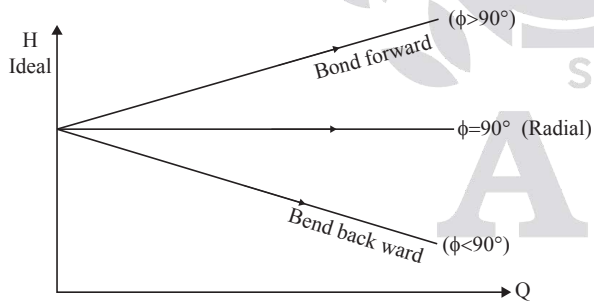
62. Ans: (b)

Sol: If Re ≤ 2000 Laminar pipe flow
If Re > 4000 Turbulent pipe flow
If 2800 < Re < 4000 Transitional pipe flow
Here Pipe flow is neither laminar nor turbulent is given i.e., 2000 and 2800
2000 is lower critical Re
2800 is upper critical Re

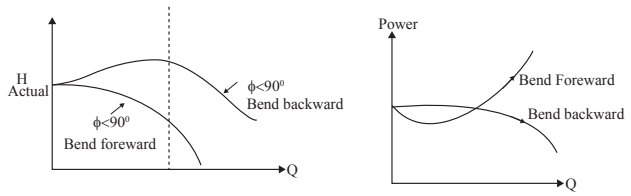
63. In centrifugal pumps, maximum efficiency is obtained when the blades are
(a) straight (b) bent forward
(c) bent backward (d) radial

63. Ans: (c)

Sol: In case of centrifugal pump, the impeller wheel vanes are so shaped i.e., bend back ward to obtain maximum efficiency of pump,



To prevent overloading of the impeller motor for in compressive fluids. bend forward vanes provided.



Power saved is obtained in bend back ward vanes

64. For pumping viscous oil, which of the following pumps will be used?
(a) Centrifugal (b) Reciprocating
(c) Fuel (d) Screw

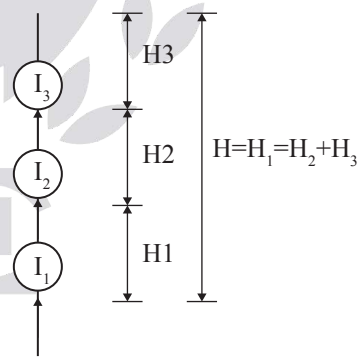
64. Ans: (d)

Sol: Screw pump is used for pumping viscous liquids. In this pump viscous liquid moves axially without turbulent which eliminates foaming formation while pumping process. In other pump, foaming formation of viscous takes place. Another reason is the discharge losses are minimum in screw pumps.

65. Multi-stage centrifugal pumps are used to obtain
(a) high discharge
(b) high head
(c) high efficiency
(d) high head and high discharge

65. Ans: (b)

Sol: In multistage pump, number of impellers are connected in series. Each impeller develop certain head which is added subsequent impellers. Hence multistage pump is used to obtain higher heads.



66. In a centrifugal pump casing, the flow of water leaving the impeller is
(a) Rectilinear (b) Radial
(c) Centrifugal (d) Forced vertex

66. Ans: (d)

Sol: Water leaving the pump impeller in side the casing is forced vortex. Due to applied power to impeller the water gets velocity due to centrifugal force.

67. The delivery head of a centrifugal pump is proportional to
(a) Speed (N) (b) N^3
(c) $\frac{1}{N^2}$ (d) N^2

67. Ans: (d)

Sol: $U \propto V$

$$\frac{\pi DN}{60} \propto \sqrt{2gH}$$

$$N.D \propto \sqrt{H}$$

$$N \propto \sqrt{H}$$

For given size of pump

$N^2 \propto H$

$\therefore H \propto N^2$

68. When the projectors are parallel to each other and also perpendicular to the plane, the projection is called as
(a) Perspective projection
(b) Oblique projection
(c) Isometric projection
(d) Orthographic projection

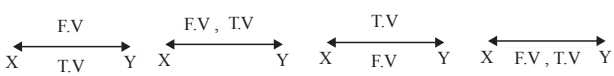
68. Ans: (d)

Sol: Perspective projections - Projectors are divergent
In oblique, Isometric and orthographic projectors are parallel to each other. Where as in oblique projection principal plane is inclined to projectors.
In orthographic projectors are to principal plane.

69. Projection of a point in the third quadrant will be
(a) top view above and front view below the X-Y line
(b) front view above and top view below the X-Y line
(c) side view above and top view below the X-Y line
(d) both top view and front view above the X-Y line

69. Ans: (a)

Sol:

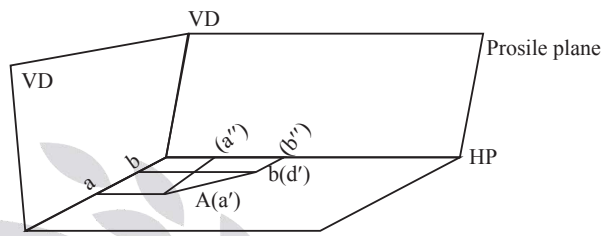


F.V - front view
T.V Top view

70. A line AB is on the horizontal plane inclined to the vertical plane at 45°. Which view from the following gives the actual length of the line AB?
(a) Front view (b) Top view
(c) Side view (d) Isometric view

70. Ans: (b)

Sol:



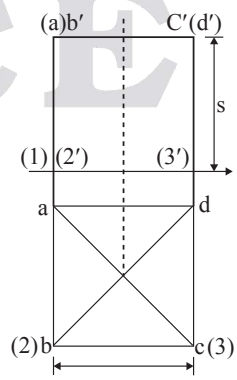
- Front view gives reduces length.
- Side view also reduces length

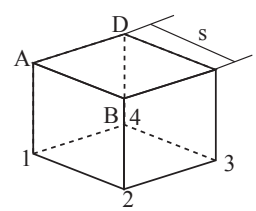
Where as top view gives true length

71. The front view of a cube,w hen resting on H.P on one of its faces and one other face is parallel to V.P is
(a) Square (b) Rectangle
(c) Parallelogram (d) Triangle

71. Ans: (a)

Sol: The following is the front view the top view at the cube for the given condition.





From the above figure it is clear that front view is a square.

72. A doubly reinforced beam is considered less economical than a singly reinforced beam because
(a) Shear reinforcement is more
(b) Compressive steel is under-stressed
(c) Tensile steel required is more than that for the balanced section
(d) Concrete is not stressed to its full value

72. Ans: (b)

Sol: A doubly reinforced beam is considered as less economical as compared to singly reinforced beam because compression steel is under stressed.

73. The purpose of lateral ties in a short column of R.C.C. is to
(a) facilitate construction
(b) facilitate compaction of the concrete
(c) avoid buckling of longitudinal bars
(d) increase load carrying capacity of the column

73. Ans: (c)

Sol: Lateral ties keep main reinforcement in Position (i.e. it will avoid buckling of longitudinal steel)

74. In a slab, the transverse reinforcement is provided at _____ to the span of the slab.
(a) 45^o (b) 60^o
(c) 75^o (d) 90^o

74. Ans: (d)

Sol: In a slab transverse reinforcement provided perpendicular (90°) to the main steel in a slab.

75. In case of two-way slabs, the limiting deflection of the slab is
(a) primarily a function of long span
(b) primarily a function of short span
(c) independent of long or short span
(d) dependent on both long and short spans

75. Ans: (b)

Sol: In case of two way slabs the limiting deflection of the slab is primarily a function of shorter span.

76. Slope correction for a distance L measured along a slope 'θ' is
(a) $2L\sin^2\frac{\theta}{2}$ (b) $L(\cos\theta - 1)$
(c) $L\tan^2\frac{\theta}{2}$ (d) $2L\cos^2\frac{\theta}{2}$

76. Ans: (a)

Sol: $CSL = L(1 - \cos\theta)$
$= 2L\sin^2\frac{\theta}{2}$

77. Measuring with a 20 m chain, which is 0.01 m too short, introduces
(a) Positive cumulative error
(b) Negative compensation error
(c) Positive compensation error
(d) Negative cumulative error

77. Ans: (a)

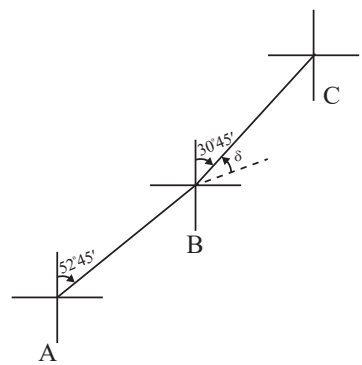
78. The curve composed of two arcs of different radii having their centres on the opposite sides of the curve is known as
(a) a simple curve (b) a reverse curve
(c) a compound curve (d) a vertical curve

78. Ans: (b)

79. The bearing of two traverse legs AB and BC are N $52^o45'$E and N $34^o30'$ E, respectively. The deflection angle is
(a) $18^o15'$E (b) $18^o15'$N
(c) $18^o15'$L (d) $18^o15'$R

79. Ans: (c)

Sol:



Deflection angle, $\delta = 52^o\,45' - 34^o\,30'$
$= 18^o\,15'$ (Left)

80. GPS consists of a total number of
(a) 12 satellites (b) 24 satellites
(c) 6 satellites (d) 18 satellites

80. Ans: (b)

81. In a green sand moulding process, uniform ramming leads to
(a) less chance of gas porosity
(b) uniform flow of molten metal into the mould cavity
(c) greater dimensional stability of casting
(d) less sand expansion type of casting defect

81. Ans: (c)

Sol: With uniform ramming action, the mould will not get distorted and hence the casting is dimensionally stable.

82. In resistance seam welding, the electrode is int he form of a
(a) cylinder (b) flat plate
(c) coil of wire (d) circular disc

82. Ans: (d)

Sol: Because the electrode has to continuously travelled, hence it should be in the circular disc form.

83. A good cutting fluid should have
(a) low thermal conductivity
(b) high specific heat
(c) high viscosity
(d) high density

83. Ans: (b)

Sol: Properties to be possessed by the cutting fluids are

- Cutting fluids should have low viscosity to permit free flow of the liquid.
- It should have high specific heat, high heat conductivity and high heat transfer coefficient.
- It should be non-corrosive to work and machine, non-toxic to operating person, odorless and stable in use and storage.
- It should be safe and permit clear view of the work operation.

84. In a shaper machine, the mechanism for tool feed is
(a) Geneva mechanism
(b) Whitworth mechanism
(c) Ratchet and Pawl mechanism
(d) Ward Leonard system

84. Ans: (b)

Sol: The Whitworth quick return mechanism converts rotary motion into reciprocating motion, but unlike the crank and slider, the forward reciprocating motion is at a different rate than the backward stroke. This mechanism is most commonly seen as the drive for a shaping machine.

85. Which type of motor is used in axial spindle drives of CNC machine tools?
(a) Induction (b) DC Servo
(c) Stepper (d) Linear Servo

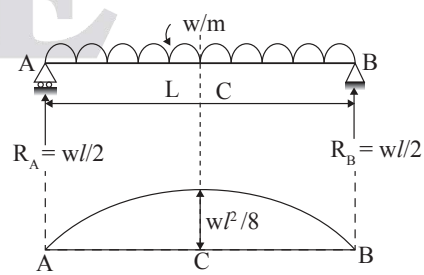
85. Ans: (b)

Sol: D.C Servo motors are used as axial or spindle drives of CNC machine tools.

86. A simply supported beam of length L and cross-sectional area A, carrying a uniformly distributed load of w, will have maximum bending moment of
(a) $\frac{wL^2}{2}$ (b) $\frac{wL^2}{4}$
(c) $\frac{wL^2}{8}$ (d) $\frac{wL^2}{16}$

86. Ans: (c)

Sol:



B.M. @ mid point 'c' = $R_A\left(\frac{L}{2}\right)-\left(w\frac{L}{2}\right)\left(\frac{L}{4}\right)$

$$\left(\frac{wL}{2}\right)\left(\frac{L}{2}\right)-\left(\frac{wL^2}{8}\right)=\frac{wL^2}{8}$$

87. Points of contra-flexure usually occur in
(a) Simply supported beams only
(b) Cantilever beams only
(c) Continuous beam only
(d) Overhanging beams only

87. Ans: (d)

88. The ratio of stress produced by suddenly applied load to that produced by the same load when gradually applied is
(a) 4 (b) 2
(c) 1 (d) $\frac{1}{2}$

88. Ans: (b)

Sol: $\sigma_{SAL} = 2\,\sigma_{GAL}$

$\therefore \frac{\sigma_{SAL}}{\sigma_{GAL}} = 2$

89. A prismatic steel rod of length L and cross-sectional area A hangs vertically under its own weight. If the weight per unit volume of the bar is W, then the strain stored in the bar would be
(a) $\frac{W^2AL^3}{6E}$ (b) $\frac{WAL^2}{6E}$
(c) $\frac{WL^2}{6AE}$ (d) $\frac{WAL}{6E}$

89. Ans: (a)

90. The forces, which meet at one point, but their lines of action do not lie in a plane, are called
(a) Coplanar non-current forces
(b) Non-coplanar concurrent forces
(c) Non-coplanar non-concurrent forces
(d) Intersecting forces

90. Ans: (b)

91. If the resultant of two forces P and Q acting at angle θ, makes angle α with the force P, then
(a) $\tan\alpha = \frac{P\sin\theta}{P + Q\cos\theta}$
(b) $\tan\alpha = \frac{P\cos\theta}{P + Q\sin\theta}$
(c) $\tan\alpha = \frac{Q\sin\theta}{P + Q\cos\theta}$
(d) $\tan\alpha = \frac{Q\cos\theta}{P + Q\sin\theta}$

91. Ans: (c)

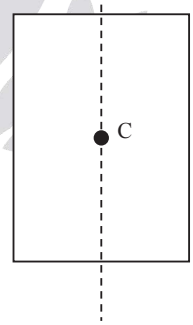
92. Lami's theorem can be applied when the number of forces is
(a) Two (b) Three
(c) Five (d) Ten

92. Ans: (b)

93. If the given plane figure is symmetrical about vertical Y-Y axis, then the centroid lies on
(a) X-X axis
(b) Vertical Y-Y axis
(c) Bottom
(d) Top

93. Ans: (b)

Sol: When a object is symmetrical about any line then the centroid will lies on that line only.



But it may shift on that line where the area is more. Given that the sign is symmetrical about YY axis, so centroid (c) always lies on YY axis.

94. The stress-strain relation of the Newtonian fluid is
(a) Linear (b) Parabolic
(c) Hyperbolic (d) Involutic

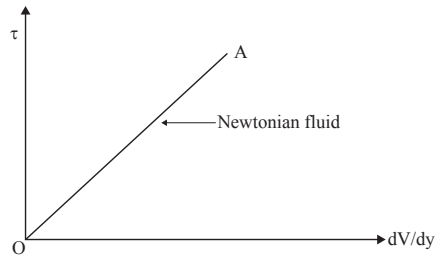
94. Ans: (a)

Sol: For Newtonian fluids,

shear stress $\propto$ Rate of shear strain

$$\tau \propto \frac{dV}{dy}$$

$$\tau = \mu . \frac{dV}{dy}$$

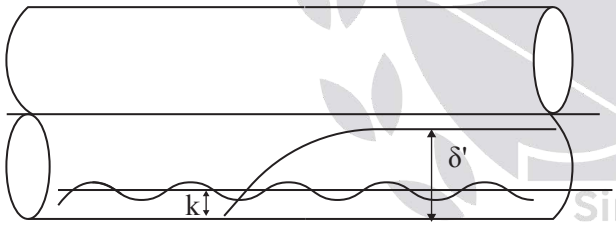


The slope of the Newtonian fluid is constant.
Here the line OA is linear.

95. The turbulent flow is hydraulically smooth, if the ratio of height of roughness projection and the thickness of the laminar sublayer is less than
(a) 1.0 (b) 0.75
(c) 0.50 (d) 0.25

95. Ans: (d)

Sol:



Let k = Roughness Height of pipe surface
δ' = Laminar sub - layer thickness

$\frac{k}{\delta'} < 0.25 \rightarrow$ Hydraulically smooth pipe surface

$0.25 < \frac{K}{\delta'} < 6.0 \rightarrow$ Hydraulically transitional pipe surface

$\frac{K}{\delta'} > 6.0 \rightarrow$ Hydraulically rough pipe surface

96. Two pipes are said to be equivalent when
(a) head loss or discharge are same in two systems
(b) length of pipe and discharge are same in two systems
(c) friction factor and length are same in two systems
(d) length and diameter are same in two systems

96. Ans: (a)

Sol: Two pipes are said to be equivalent if their discharge and head loss are same.

97. Newton's law of viscosity is a relationship between
(a) pressure, velocity and temperature
(b) shear stress and shear strain
(c) shear stress and velocity
(d) rate of shear strain and measurement

97. Ans: (*)

Sol: Newton's law of viscosity is a relationship between shear stress and rate of shear strain (or) shear rate.

98. When the centrifugal pump is started, there will be no flow of water until the pressure rise int he impeller is large enough to overcome the
(a) Static head (b) Total head
(c) Manometric head (d) Friction head

98. Ans: (c)

Sol: In order deliver water centrifugal pump, head must be produced by the pump to satisfy the external requirement, which includes static head, head loss due to friction and velocity head.

$$H_{mano} = H_{static} + h_f + \frac{v^2}{2g} + ...$$

When the pump is started, there will be no flow until the pressure rise in the impeller is more than or equal to the manometric head.

In other words the centrifugal head developed by the impeller should be greater than the manometric head.

Therefore, the minimum starting period of the pump impeller at which the centrifugal head is equal to manometric head.

99. Specific speed of pump is indicated as
(a) $\frac{N\sqrt{Q}}{H^{3/4}}$ (b) $\frac{N\sqrt{P}}{H^{5/4}}$
(c) $\frac{N\sqrt{Q}}{H^{2/3}}$ (d) $\frac{N\sqrt{Q}}{H^{5/4}}$

99. Ans: (a)

Sol: $N_{S,pump} = \frac{N\sqrt{Q}}{(H)^{3/4}}$

It is an index of pump impeller design that describes the relationship between head developed by rotation of impeller relative to the discharged delivered by it.

100. The object we see in our surroundings usually without drawing , comes under which projection?
(a) Perspective projection
(b) Oblique projection
(c) Isometric projection
(d) Orthographic projection

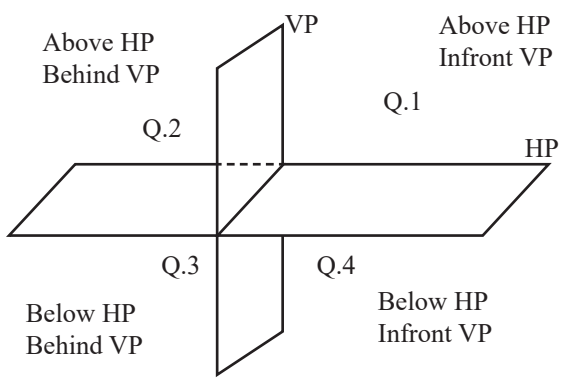
100. Ans: (a)

Sol: In perspective projection observer is at finite distance from a object. So surroundings are appears will be drawn in perspective projection where as in orthographic, oblique, isometric projections observer can be considered at infinite position.

101. A point 'P' is above the horizontal plane (HP) and in front of the vertical plane (VP). The point is in
(a) First quadrant (b) Second quadrant
(c) Third quadrant (d) Fourth quadrant

101. Ans: (a)

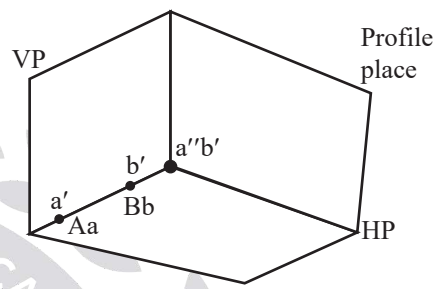
Sol: ∴ Above HP Sc
In front VP belongs to first quadrant



102. If a straight line AB lies on a horizontal plane and vertical plane, then which of the following gives a point?
(a) Side view (b) Top view
(c) Front view (d) Isometric view

102. Ans: (a)

Sol: In the figure



AB - Line
a 'b' - Front view
a b - Top view
a" b" - is side view
Here a'b', ab co-insides with AB, .. it is a line.

103. When a plane surface is inclined to any plane of projection, the view of the plane surface projected on it will be its
(a) Point shape (b) True shape
(c) Straight line (d) Apparent shape

103. Ans: (d)

Sol:

- When a plane is parallel to the projection plane then on that projection plane True shape can be obtained.
- When a plane is perpendicular to the projection then the view on that projection plane at appears as a straight line.
- When a plane is inclined to the projection plane then the view on that plane should be reduced (or) compressed (or) apparent shape.

104. A rectangular beam 100 mm wide and 100 mm deep is subjected to a shear of 10×10^3 N. it will

105. In the limit state design approach, the main reinforcement primarily controls
(a) Collapse (b) Deflection
(c) Cracking (d) Durability

105. Ans: (a)

Sol: In limit state design approach the main reinforcement primarily controls collapse of the structure.

106. What is the value of the flexural strength of M 25 concrete in MPa?
(a) 1.5 (b) 2.5
(c) 3.5 (d) 4.5

106. Ans: (c)

Sol: As per IS: 456 - 2000, the flexural tensile strength of concrete is
$f_{cr} = 0.7\sqrt{f_{ck}} = 0.7\sqrt{25} = 3.5\ N/mm^2$
For M25$\rightarrow f_{ck} = 25\ N/mm^2$.

107. The reduced bearing corresponding to the whole circle bearing 211° 35′ is
(a) S 31° 35′ W (b) S 31° 35′ E
(c) N 31° 35′ E (d) N 31° 35′ W

107. Ans: (a)

Sol: S 31°35′W
211°35′ – 180° = 31°35′

108. Closed contours of decreasing values towards centre indicate
(a) a hill (b) a river bed
(c) a depression (d) a mountain pass

108. Ans: (c)

109. If the fore bearing of a line AB is 40° 35′, its back bearing is
(a) 220° 15′ (b) 310° 35′
(c) 130° 35′ (d) 220° 35′

109. Ans: (d)

Sol: F.B = 40° 35′
B.B = 40°35′ + 180°
= 220° 35′

110. Sum of measured internal angles for a closed traverse shall be equal to (where N = the number of sides of traverse)
(a) (2N - 4) × 90° (b) (N–4) × 90°
(c) (2N - 3) × 90° (d) (2N + 3) × 90°

110. Ans: (a)

Sol: Sum of the internal angles for a polygon having 'n' sides
= (2N - 4) × 90°

111. The primary function of a riser is to
(a) Feed molten metal to casting as it solidifies
(b) Prevent atmosphere air from contaminating the metal in the mould
(c) allow gases to easily escape from mould cavity
(d) allow molten metal to rise above the mould cavity

111. Ans: (a)

Sol: The primary function of a riser is to feed metal to the casting as it solidifies.

112. In arc welding, temperature generated is of the following order:'
(a) 1000°C (b) 3500°C
(c) 5500°C (d) 8000°C

112. Ans: (c)

Sol: Electric arc between the electrode and work piece closes the electric circuit. The arc temperature may reach 5500°C, which is sufficient for fusion the work piece edges and joining them.

113. Laser welding is widely employed in welding
(a) heavy structures
(b) precious metal joints
(c) under water metal joints
(d) micro spot joints

113. Ans: (d)

Sol: Laser spot welding is a versatile technique for welding of small components, such as attaching wires to terminals.

114. Continuous chips are formed when machining
(a) ductile metal
(b) brittle material
(c) heat treated material
(d) with pressure and heat against the tool

114. Ans: (a)

Sol: Continuous chips are formed when the ductile material is machined with high cutting speed and minimum friction between the chip and tool face.

115. The shear modulus of most of the materials with respect to modulus of elasticity is
(a) equal to half (b) less than half
(c) more than half (d) twice

115. Ans: (b)

116. The energy stored in a body within elastic limits is known as
(a) Resilience
(b) Proof Resilience
(c) Strain energy
(d) Impact energy

116. Ans: (a)

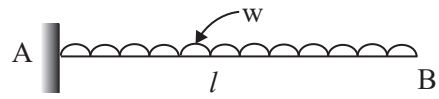
117. When the load on the free end of a cantilever beam is increased, failure will occur
(a) at the free end
(b) at the fixed end
(c) in the middle of the beam
(d) at a distance $\frac{2L}{3}$ from the free end

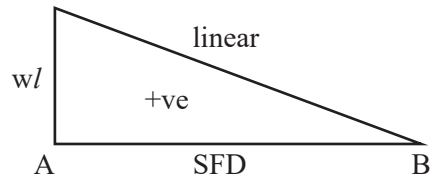
117. Ans: (b)

118. The shear force diagram for a cantilever beam of length L and carrying a uniformly distributed load *l* per unit length will be
(a) a right-angled triangle
(b) an isosceles triangle
(c) an equilateral triangle
(d) a rectangle

118. Ans: (a)

Sol:





119. Two parallel forces equal in magnitude and opposite in direction and separated by a definite distance are said to form a
(a) Moment
(b) Couple
(c) Resultant
(d) Equilibrium

119. Ans: (b)

120. If two concurrent forces, each of P, act at right angles to each other their resultant is
(a) 2P (b) P
(c) $P\sqrt{2}$ (d) $P\sqrt{P}$

120. Ans: (c)

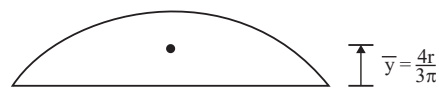
Sol: $R = \sqrt{P^2 + Q^2 + 2PQ\cos\theta}$

$R = \sqrt{P^2 + P^2} = \sqrt{2P^2} = \sqrt{2}.P$

121. The centre of gravity of a semi-circle lies at a distance of _____ from its base measured along the vertical axis.
(a) $\frac{3r}{8}$ (b) $\frac{4r}{3\pi}$
(c) $\frac{8r}{3}$ (d) $\frac{3r}{4\pi}$

121. Ans: (b)

Sol:



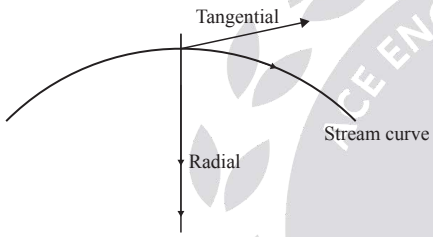
122. Moment of Inertia does not depend on
(a) angular velocity of the body
(b) mass of the body
(c) distribution of mass of the body
(d) axis of rotation of the body

122. Ans: (a)

123. A flow whose stream line is represented by a curve is called
(a) one-dimensional flow
(b) two-dimensional flow
(c) three-dimensional flow
(d) four-dimensional flow

123. Ans: (b)

Sol:



124. According to Bernoulli's equation

(a) $Z + \frac{P}{W} + \frac{v^2}{2g}$ = constant

(b) $Z + \frac{P}{W} - \frac{v^2}{2g}$ = constant

(c) $Z - \frac{P}{W} + \frac{v^2}{2g}$ = constant

(d) $Z - \frac{P}{W} - \frac{v^2}{2g}$ = constant

124. Ans: (a)

Sol: Bernoulli's Energy Equation is represented in the form total head (Energy/Newton weight of fluid)

$Z + \frac{P}{W} + \frac{v^2}{2g}$ = constant

Constant has units in 'meters'

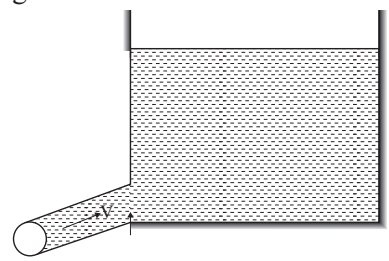
125. The loss of head at the entrance in a pipe is

(a) $\frac{v^2}{2g}$ (b) $\frac{0.5v^2}{2g}$

(c) $\frac{0.375v^2}{2g}$ (d) $\frac{0.75v^2}{2g}$

125. Ans: (b)

Sol: Loss of head at energy of pipe is considered as $\frac{0.5v^2}{2g}$



126. Reynolds number is the ratio of inertia force to
(a) Pressure ratio (b) Elastic ratio
(c) Gravity ratio (d) Viscous ratio

126. Ans: (d)

Sol: Reynolds number is defined as the ratio of inertia force to viscous force $Re = \frac{F_{inertia}}{F_{viscous}}$

127. Axial flow pump is started with its delivery valve
(a) Kept fully closed
(b) Kept fully open
(c) Irrespective of any position
(d) Kept 50% open

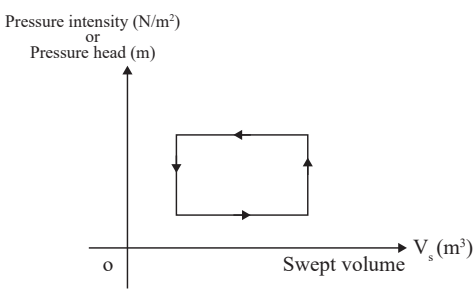
127. Ans: (b)

Sol: While starting axial flow pump delivery value is kept open fully as it delivers high discharge, without much head raised.

128. Indicator diagram of a reciprocating pump is a graph between
(a) flow vs. swept volume
(b) pressure in cylinder vs. swept volume
(c) flow vs. speed
(d) pressure vs. speed

128. Ans: (b)

Sol:



Indicator diagram of a reciprocating pump is a graph between pressure or pressure head in the cylinder and swept value of the piston developed.

129. For a very high discharge at low pressure such as flood control and irrigation applications, the following type of pump is preferred
(a) Centrifugal (b) Axial flow
(c) Reciprocating (d) Mixed flow

129. Ans: (b)

Sol: Axial flow type pump has feature of high discharge of low pressure heads. It is a special attention pump found in applications such as flood control and irrigation etc.

130. The percentage slip for a reciprocating pump is defined as the percentage of

(a) $\frac{\text{Actual discharge}}{\text{Theoretical discharge}}$

(b) $\frac{\text{Actual speed}}{\text{Theoretical speed}}$

(c) $\frac{\text{Swept volume}}{\text{Cylinder volume}}$

(d) $\frac{\text{Theoretical discharge - Actual discharge}}{\text{Theoretical discharge}}$

130. Ans: (d)

Sol: $\text{SLIP (S)} = \frac{\text{Slip discharge}}{\text{Theoretical discharge}}$

$= \frac{Q_{slip}}{Q_{the}}$

$\%\ \text{slip} = \frac{Q_{the} - Q_{act}}{Q_{the}} \times 100$

131. Power required to drive the centrifugal pump is proportional to
(a) Impeller diameter (D) (b) D^2
(c) D^6 (d) D^4

131. Ans: (*)

Sol: Power of pump = ρgQH

$U \propto V$

$\frac{\pi DN}{60} \propto \sqrt{2gH}$

$\sqrt{H} \propto N.D$

$H \propto N^2D^2$ -------(1)

$Q \propto D^2\sqrt{H}$ -------(2)

$P \propto QH$

$P \propto D^2.\sqrt{H}.H$

$P \propto D^2.ND.N^2D^2$

$P \propto D^5.N^3$

Hence, conditions is not given either speed kept constant.

$[P \propto D^5]$

132. Which of the following conics has an eccentricity of unity?
(a) Circle (b) Parabola
(c) Hyperbola (d) Ellipse

132. Ans: (b)

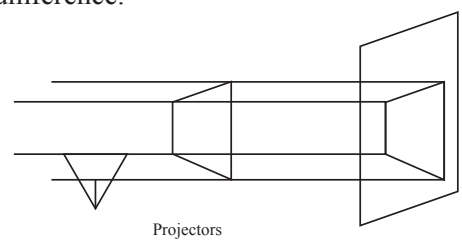
Sol:

Conics	**Eccentricity**
Circle	$e = 0$
Ellipse	$e < 1$
Parabola	$e = 1$
hyperbola	$e > 1$
Rectangular hyperbola	$e = \sqrt{2}$
Straight line	$e = \infty$

133. The straight lines which are drawn from various points on the contour of an object to meet a plane are called as
(a) Connecting lines (b) Projectors
(c) Perpendicular lines (d) Hidden lines

133. Ans: (b)

Sol: Contour of an object are the outer point of the circumference.



Projectors

134. In the orthographic projection, projection lines are ____ to each other.
(a) Parallel
(b) Perpendicular
(c) Inclined
(d) Diagonal

134. Ans: (a)

Sol: In Ortho graphic projection
- Observer is at institute position so projectors will be parallel to each other (i.e. projection lines)
- Where as projectors (projection lines) are perpendicular to principal plane.

135. _____ is a curve generated by a point on the circumference of a circle, as the circle rolls without slipping along a straight line.
(a) Cycloid (b) Epicycloid
(c) Epitrochoid (d) Trochoid

135. Ans: (a)

Sol: When a circle is rolling on an other fixed surface the curves generated by the point is called cycloidal curves.
- When circle rolls on straight line the generated curves of a point on the circle is called cycloid.
- When circle rolls outside another circle is called Epi cycloid.
- When the locus of the point is outside (or) inside the rolling circle then it curve is called trochoid.

136. According to IS 456 : 2000, the flexural strength of concrete, in N/mm^2, is given by
(a) $0.07\sqrt{f_{ck}}$ (b) $0.7\sqrt{f_{ck}}$
(c) $0.007\sqrt{f_{ck}}$ (d) $7\sqrt{f_{ck}}$

136. Ans: (b)

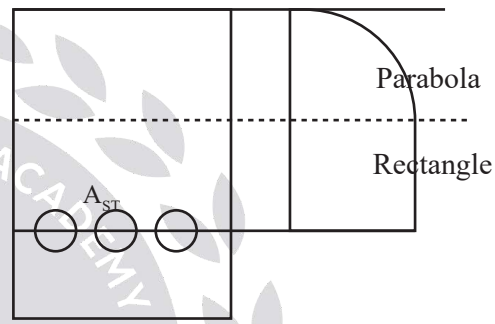
Sol: As per IS: 456 - 2000, the flexural strength of concrete is

$f_{cr} = 0.7\sqrt{f_{ck}}$

137. For a reinforced concrete section, the shape of shear force diagram is
(a) Wholly parabolic
(b) Wholly rectangular
(c) Parabolic above neutral axis and rectangular below neutral axis
(d) Triangular

137. Ans: (c)

Sol: Shear stress distribution in an R.C rectangular beam is above N.A parabola and below N.A rectangular.



138. The vertical deflection limits are assumed to be satisfied provided the span to depth ratio for simply supported spans are not greater than
(a) 25 (b) 20
(c) 30 (d) 40

138. Ans: (b)

Sol: As per IS: 456-2000, the span to effective depth ratio to satisfy vertical deflection limit for simply supported beams is 20

$$\frac{L}{d} = 20$$

139. A compression member may be considered as short when both the slenderness ratios l_{ex} / D and l_{ey} / D are less than
(a) 20 (b) 2 (c) 21 (d) 12

139. Ans: (d)

Sol: As per IS : 456 - 2000, A compression member is said to be short column if $\frac{L_{ex}}{D}$ and $\frac{L_{ey}}{D}$ less than 12

$\lambda \le 12 \rightarrow$ short column

140. As per IS 456 : 2000, the minimum area of tension reinforcement for structural member shall not be less than
(a) $\frac{A_s}{bd} = \frac{0.85}{f_y}$ (b) $\frac{A_s}{bd} = \frac{0.95}{f_y}$
(c) $\frac{A_s}{b} = \frac{0.85}{f_y}$ (d) $\frac{A_s}{bd} = \frac{0.75}{f_y}$

140. Ans: (a)

Sol: As per IS: 456-2000, the minimum area of tension reinforcement in a beam is

$$\frac{A_s}{bd} = \frac{0.85}{f_y}$$

141. Which of the following is an example for an obstacle which obstructs chaining but not ranging?
(a) A Hill (b) A Lake
(c) A Valley (d) A Building

141. Ans: (b)

142. Correction to be applied for a 30 m long chain length along a slope of θ is
(a) 30 (1-cos θ) (b) 30 cos θ
(c) 30 (cos θ -1) (d) 30(sec θ -1)

142. Ans: (a)

Sol: CSL = L (1 – cosθ)
= 30 (1– cosθ)

143. Cross-staff is used for
(a) measuring contour gradient
(b) setting out right angles
(c) taking levels
(d) measuring distances

143. Ans: (b)

144. The imaginary line joining the intersection of the cross-hairs and the optical centre of the objective is called
(a) Latitude
(b) Line of departure
(c) Line of collimation
(d) Magnetic deflection

144. Ans: (c)

145. Cold working of steel is defined as working
(a) at its recrystallisation temperature
(b) above its recrystallisation temperature
(c) below its recrystallisation temperature
(d) at two-thirds of the melting temperature of the metal

145. Ans: (c)

Sol: Cold working is defined as the plastic deformation of a metal below its recrystallization temperature.

146. In order to facilitate withdrawal of pattern
(a) the pattern is made smooth
(b) water is applied on pattern surface
(c) shrinkage allowance is made on patterns
(d) draft is provided on pattern

146. Ans: (d)

Sol: Draft: For easy withdrawal of the patterns, draft is provided. It refers to the taper put on the surface parallel to the direction of withdrawal of the pattern from the mould cavity.

147. NC contouring is an example of
(a) continuous path positioning
(b) point to point positioning
(c) absolute positioning
(d) incremental positioning

147. Ans: (a)

Sol: Producing a contour is the path function.

148. A toothpaste tube can be produced by
(a) Solid forward extrusion
(b) Solid backward extrusion
(c) Hollow backward extrusion
(d) Hollow forward extrusion

148. Ans: (c)

Sol: Backward impact extrusion is most common method. Products made by this process include toothpaste tubes and battery cases,

149. If Poisson's ratio of a material is 0.3 then the ratio of Young's modulus to bulk modulus is
(a) 0.6 (b) 0.8 (c) 1.2 (d) 1.4

149. Ans: (c)

Sol: $E = 3k(1-2\mu)$

$$\frac{E}{k} = 3(1-2(0.3)) = 1.2$$

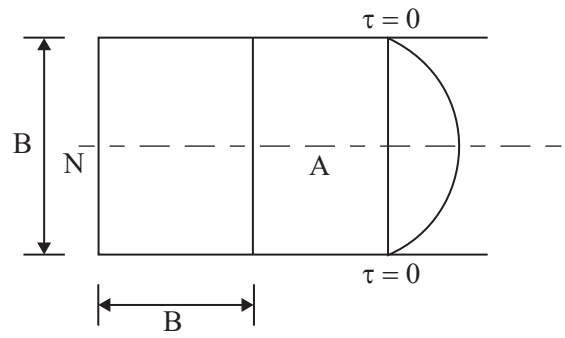
150. For a beam of square cross-section B × B, the location of minimum shear stress from the top fibre will be the distance of

(a) zero (b) $\frac{B}{4}$

(c) $\frac{B}{2}$ (d) $\frac{B}{8}$

150. Ans: (a)

Sol:



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